ROADS and STREETS

UNIVERSITY MICROFILMS
EUGENE B. POWER R6
313 N. 1ST ST.
ANN ARBOR, MICH.
COM'-LAY-11-50

HIGHWAYS • BRIDGES • AIR FIELDS • HEAVY CONSTRUCTION

A GILLETTE PUBLICATION

Gillette Publishing Co., 22 West Maple St., Chicago 10, Illinois • Accepted as Controlled Circulation Publication at Milwaukee, Wis.

Portable Crusher Produces
140 Tons Per Hour . . . page 26

Tractor Mounted Drills "Take" 700,000-yd. Cliff . . . page 56

Portfolio of Prestressed Bridges . . . begins on page 83

Duluth's Main Street Paved at Night . . . page 154

November 1957

Plenty of push behind the punch...

MODEL 75-P Smith Air Compressor weighs only 1,450 lbs. yet delivers over 75 cu. ft. of air per minute. Compact design makes it easy to maneuver even over rough terrain, easy to tow even at high speeds. Economical to operate, too. One important reason for the low weight to output ratio: the Smith Compressor is powered by a peak efficiency Chrysler Industrial Engine—Weight: 740 lbs. Displacement: 265 cu. in. Equally important, the engine is specially built for continuous operation under extreme dust conditions. For example, hardened crankshaft, tri-metal bearings, hardened exhaust valve seats assure long life with minimum maintenance.

CHRYSLER INDUSTRIAL 32

in-line 6 Engine (265 cu. in. displacement) powers Smith Compressor—and many other makes of equipment in the construction and materials handling field. There are four Chrysler in-line 6s, two V-8s —ranging from 230 to 354 cu. in. displacement.

Chrysler
INDUSTRIAL ENGINES
INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

Write Dept. G11, Industrial Engine Division, Chrysler Corporation, Detroit 31, Michigan, or see your nearest Chrysler Industrial Engine Dealer.

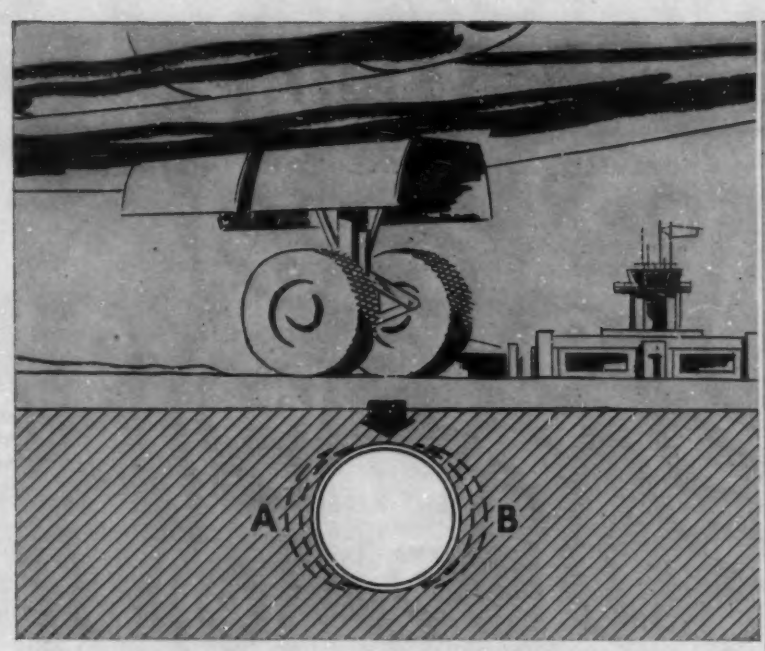
☐ For engineering information ☐ For descriptive literature

Name_____

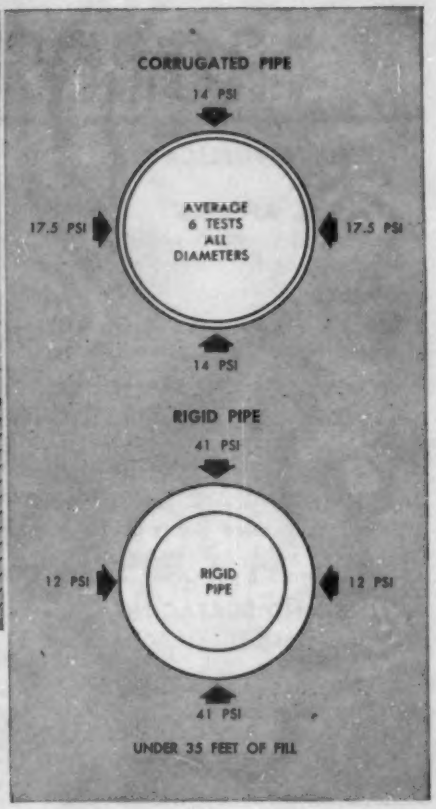
Address_____

City_____ Zone____ State_____

. . . for more details circle 250 on enclosed return postal card



Airplane landing above a buried culvert illustrates the flexibility of the cross-section of a Beth-Cu-Loy pipe.



Showing approximate average pressures on both rigid and flexible test culverts under tracks of Illinois Central RR, Farina, Ill. (A.R.E.A. test).

Why Beth-Cu-Loy's flexibility is so important in drainage pipe

When you look head-on at a drainage pipe made from galvanized corrugated Beth-Cu-Loy sheets, you might well marvel that those thin sidewalls can support the load! Yet it's that same thin-ness that gives a Beth-Cu-Loy culvert its outstanding characteristic: flexibility.

Let's see how big a difference flexibility can make. A culvert made from Beth-Cu-Loy sheets can, because of its flexibility, enlist the aid of the surrounding material to support imposed loads. Thus in the typical example shown at upper left, the load produces controlled deflection in the pipe. As points A and B move into and compact the trench walls, a load begins to develop around these points and tends to distribute the pressures peripherally.

Rigid pipe, on the other hand, cannot flex with the load and thus cannot transfer an appreciable portion of the load to the surrounding material. The bulk of the pressure is exerted through the vertical axis of the pipe. This point is graphically portrayed by the diagrams at upper right. The figures used in the diagrams were obtained in an A.R.E.A. test conducted at Farina, Illinois, to determine the approximate average pressures on both flexible and rigid-type culverts. This test, like other research and experiments, demonstrates clearly that flexibility accounts in large part for the ability of corrugated metal pipe to carry the load.

Bethlehem does not fabricate culvert pipe. But we do manufacture galvanized Beth-Cu-Loy (copper-bearing steel) sheets, which fabricators make into pipe. If you would like further information about Beth-Cu-Loy, or the pipe made from it, just get in touch with the nearest Bethlehem sales office, or write to the address below.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

. . . for more details circle 243 on enclosed return postal card

ROADS AND STREETS

A GILLETTE PUBLICATION • NOVEMBER, 1957 • VOLUME 100 • NUMBER 11

NATIONAL AFFAIRS

Roads and Streets Newsletter 19
—By Duane L. Cronk, Washington Editor

EDITORIAL

Who Should Plan Our Urban Highways? 55
Test Projects for Prestressed Pavement 55

PORTFOLIO OF PRESTRESSED BRIDGES

Two Firsts in North Carolina 83
97-Ton Girders Set by Special Gantries 86
Prestressed Girders Rolled Out on Dollies ... 89

EARTHMOVING AND EXCAVATION

Tractor Mounted Drills on 700,000 Cubic Yard Cliff 56
—By Harold J. McKeever, Editor-in-Chief

PAVING AND SURFACING

Unique Batch Hauling Service for Turnpike Paving 66
200,000 Foot Curb-Gutter Job 69
Discussion of Proposed "No Steel" Prestressed Concrete Pavement Design 108
—By H. Kent Preston, with comment by Edwin J. Coppage, Jr.
Macadam for Heavy-Duty Bypass 147
—By Fred Swineford, Engineer-Manager, Macadam Pavements, Inc.
Night Paving of Duluth's Main Street 154
—By H. K. Glidden, Contributing Editor

HIGHWAY MAINTENANCE

More Durable Paint Stripes for Concrete Roads 73
—By Charles J. Kearse and Louis Horn, Texas A & M College

RESEARCH AND TESTING

New Concrete Beam Testing Machine 79
—By Hubert E. McDonell, Assistant Engineer of Materials and Tests, Florida State Road Department
Report on Subgrade Investigation 52

CONTRACTOR JOB SAFETY

Any Safety Program is Practicable 43
—By Morris E. DeWitt, General Manager, Porter-DeWitt Construction Co.
Safety Rules for Shoring Concrete 78

PUBLIC RELATIONS

"What About Bypass" Explained by Wyoming Booklet 92

ROAD DESIGN

Design Standards for Tomorrow's Highways 96
—Staff review of talk by Charles M. Noble, given at recent ITE convention

EQUIPMENT APPLICATION

Big Rubber Tired Ripper Uproots Macadam 94
Portable Rock Drill Digs 12,000 Post Holes..142

DRAINAGE AND CULVERTS

Tunnelers Thread Pipe Under Queen Elizabeth Highway 162

MEETINGS AND CONVENTIONS

AGC Holds Fall Board Meeting 133

MISCELLANEOUS

Personnel Problems 167
Caterpillar Dedicates Metallurgical Laboratory 169

DEPARTMENTS AND FEATURES

This Month's Cover Scene 26
Personals 30
Meetings Ahead 39
New Publications 36-46
Court Decisions for Contractors 138
Views and Comments 150
—By H. G. Nevitt

WHERE TO BUY IT

Reader Inquiry Card .....Opposite Page 112
New Products 112
Manufacturers' Literature 165
With the Manufacturers and Distributors...172
Clearing House (Used Equipment Advertising) 173
Advertisers' Index 184

Coming Articles

Who Has the Big Road Contracts?
A year-end review of state highway jobs awarded or in force, with list of the top contractors and their current "work load."

Aluminum's Growing Role
How this "magic metal" has come along as a big-tonnage item in the highway program, for contractor equipment as well as bridge railing and other specification items.

Airfield Methods for Jet Runways
Vibratory compaction of 7,600,000 cu. yd. of sand at Griffiss Air Force Base . . . Concrete paving to the new close tolerances (two project reports coming)... New method for surface treating tar-rubber concrete.

Continuing Rock Excavation Series
A western project, where a mountain was "daylighted" for a relocation . . . When and how contractors are using the new heavier drill-rigs (staff review).

Also in the Editor's Mill
Flexible base methods: various tricks used by state's contractors to meet specs under varying conditions... Hardfacing: What contractors need to know about its potentialities for saving equipment maintenance . . . Watch for reports of the autumn conventions (AASHO and others), where problems in the expanding highway program will be reviewed.

▲ One of "the earth-movin'est earth-movers around," Holloway Construction Co., Livonia, Mich., proved it again when grading for relocation of U. S. 16 at Brighton, Mich. Work started 12 days after job was let — and 6 miles of sand, clay and muck up to 40 feet deep were hustled as never before. Tires shown are Goodyear TUBELESS Sure-Grip Lug — built with triple-tempered TRIPLE-TOUGH 3-T NYLON Cord.

▲ GOODYEAR BIG TIRE SERVICE at Holloway's U. S. 23 relocation job at Fenton, Mich. Strategically located, well-equipped, well-manned service like this cuts down time to a minimum wherever Goodyear helps jobs roll. Tire shown is Goodyear TUBELESS again!

80% CUT in earth-mover tire down time!

*That just **begins** your savings with 3-T Nylon Cord*

TUBELESS TIRES!

ON JOB AFTER JOB, contractors agree that tube and flap troubles cause up to 80% of tire down time. End tubes and flaps and those troubles end, too—and you also save on tube replacement and inventories.

You save time mounting—you save extra valve parts—you save on maintenance, for with Goodyear TUBELESS many repairs may be made *without removing tires!*

YOU SAVE TIRES, TOO—for with Goodyear TUBELESS, small injuries usually show *before* they get serious.

So be sure you specify Goodyear 3-T Nylon Cord TUBELESS tires on all new equipment—and see your Goodyear dealer for change-over of present vehicles. Goodyear, Truck Tire Dept., Akron 16, Ohio.

Buy and Specify

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

All-Weather, Road Lug, Sure-Grip—T.M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

. . . for more details circle 266 on enclosed return postal card

NOW TUBELESS OR TUBE-TYPE
WITH 3-T NYLON CORD!

SURE-GRIP LUG

ALL-WEATHER EARTHMOVER

HARD ROCK LUG

HARD ROCK RIB

ROAD LUG

Look for this nearby Goodyear dealer sign for better tire values—better tire care.

Veteran operator Delbert Corman "at ease" while his Cleveland is digging gas and water lines for a Lexington, Ky. subdivision

Cleveland's exclusive multi-speed transmission provides right power/speed ratio for every job

"For easy handling and dependable digging even under the toughest trenching conditions give me a Cleveland every time," says long-time heavy equipment operator Delbert Corman of Aldridge & Poage Co., Lexington, Ky., owners of 3 Clevelands. Thousands of trench operators and owners throughout the world agree with him. Credit for this world-wide preference for Clevelands is due to the perfectly balanced combination of practical performance-proved features found in every Cleveland. Practically every modern trencher feature originated with Cleveland. But no single trencher feature ever developed is the equal of Cleveland's exclusive multi-speed crawler transmission.

For *each* of 4 digging wheel speeds this transmission provides 12 individual crawler speeds forward and 12 reverse, all closely and evenly graduated. The 48 forward speeds give the operator a choice of over 30 *practical* digging speeds—over 30 usable *combinations* of digging wheel and crawler speeds, providing the *right* combination of power and speed for digging every soil, under every digging condition. The following table of non-slipping, power-saving digging speeds for the Cleveland 95 is typical.

Cleveland's exclusive multi-speed transmission has no equal

For each of 4 wheel speeds	there are 12 individual crawler speeds											
With Main Transmission (and Digging Wheel) in	SPEEDS (in Feet per Minute) — Available in Either Direction (Bold Face Indicates Most Commonly Used Digging Speeds)											
First Speed	.5	.7	1.1	1.5	2	2.8	3.4	4.7	5.9	12.6	22.5	38
Second Speed	1	1.4	2.2	2.9	3.9	5.3	6.6	9	11.5	23.8	43	73
Third Speed	2	2.8	4.3	5.8	7.8	10.6	13.3	17.9	22.8	47	86	146
High Speed (Ordinarily used when digging)	3.3	4.6	7.1	9.5	12.8	17.5	21.7	29.6	38	78	143	240
Reverse (not used when digging)	.4	.6	.9	1.2	1.6	2.2	2.7	3.7	4.8	9.9	18	30

THE CLEVELAND TRENCHER CO.

20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

Good Everywhere

. . . for more details circle 253 on enclosed return postal card

ROADS AND STREETS

Devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations; the construction and maintenance of airports. Represents 65 years of continuous publishing in the highway field; combined with Engineering and Contracting and Good Roads Magazines, established in 1892.

•

HAROLD J. MCKEEVER, *Editor-in-Chief*
V. J. BROWN, *Vice Pres. and Coordinator*
CHARLES T. MURRAY, *Managing Editor*
JOHN C. BLACK, *Associate Editor*
H. K. GLIDDEN, H. C. PERSONS,
H. G. NEVITT, C. R. SHUPE,
Contributing Editors
DUANE L. CRONK, *Washington Editor*
JAMES R. CUMMINGS, *Assistant Editor*
GEORGIA ZOGRAFOS, *Editorial Secretary*

BPA

GILLETTE PUBLISHING COMPANY

Publication and Editorial Offices:
22 West Maple Street, Chicago 10, Ill.

HALBERT P. GILLETTE
President and Publisher
V. J. BROWN, Vice President
F. H. G. FORSYTHE, Vice President
HALBERT S. GILLETTE
Vice President and Assistant Publisher

•

Chicago Office: 22 West Maple St.
Superior 7-1581
R. T. Wilson, Gen. Sales Manager
Fred H. Bowes, Representative
Morgan K. Cottingham, Representative
E. Bender, Clearing House Manager
J. L. Latta, Production Manager
L. R. Vickers, Circulation Manager
S. Provus, Research Director

New York Office: 87 Wolf's Lane,
Pelham, N.Y., Pelham 8-3200
F. A. Michel Jr., Eastern Manager

Cleveland Office: 516 The Arcade
Cherry 1-5638
Ray Keine, Manager

Pasadena Calif: Sycamore 4-6328
West Coast Office: 1126 Del Rey,
J. A. Osborne, Manager

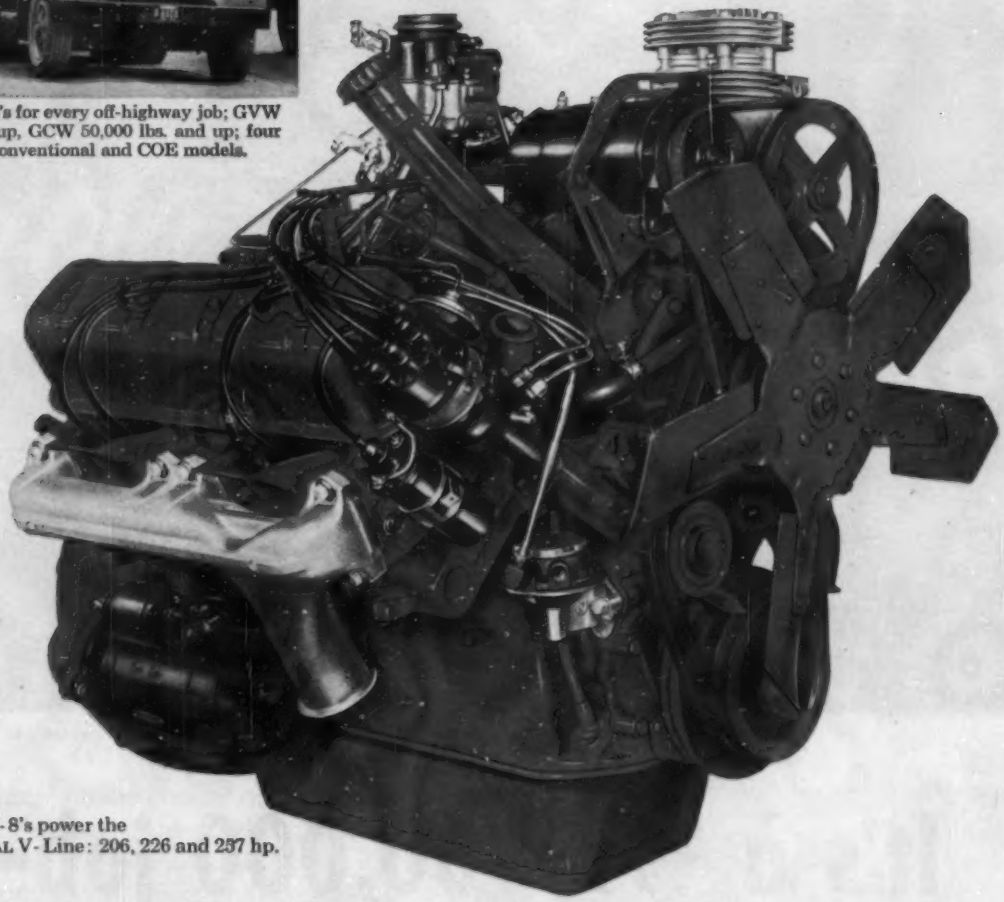
OTHER GILLETTE PUBLICATIONS

Magazines
Rural Roads • Street Engineering
Bituminous Roads and Streets
World Construction
Caminos y Construccion Pesada

Prefiled Catalogs
Heavy Construction (U.S. & Canada)
World Construction (International)
Construction Pesada (Latin)

Heavy-duty V-8's for every off-highway job; GVW 24,000 lbs. and up, GCW 50,000 lbs. and up; four and six-wheel; conventional and COE models.

Most GO under any truck hood!



Three great V-8's power the INTERNATIONAL V-Line: 206, 226 and 237 hp.

INTERNATIONAL HEAVY-DUTY V-8's

Introduced last year—and smashing performance records ever since—INTERNATIONAL Heavy-Duty V-8's give you the most productive V-8 power in any truck.

Make more trips on short hauls! Save more time on long hauls! Get your loads moving faster, keep them rolling with less shifting. More ton-miles per gallon, too.

INTERNATIONAL V-8's make more money for their users because they do what other trucks cannot. Get the facts today from your nearby INTERNATIONAL Truck Dealer or Branch. International Harvester Company, Chicago, Illinois.

Motor Trucks, Crawler Tractors
Construction Equipment,
McCormick® Farm Equipment
and Farmall® Tractors

Fleet cost records prove

INTERNATIONAL TRUCKS cost least to own!

... for more details circle 320 on enclosed return postal card

Excavation for powerhouse at Priest Rapids Dam is over 4,000 feet long and between 40 to 90 feet deep.

It's a $92,000,000 job—
and Texaco helps keep it on schedule

This $92,000,000 Priest Rapids Dam project is the second largest competitively bid contract ever awarded to a single contractor. It is being constructed by Merritt-Chapman & Scott. There is no time for down-time on a colossal job like this, so Merritt-Chapman & Scott—knowing from past experience the value of a Texaco Simplified Lubrication Plan—started it off by calling in a Texaco Lubrication Engineer to work out a Plan.

This is the most far-sighted step in any lubrication program because it cuts inventory down to as few as 6 products to handle all major lubrication. That minimizes chances of making lubrication mistakes, and trims your maintenance expense. Above all, the Texaco Simplified Lubrication Plan is a big help in keeping your jobs on schedule.

Merritt-Chapman & Scott, for example, extend their engines' service period between overhauls with *Texaco Ursa Oil Super Duty Special*. They also get full rated engine power and save on fuel. They get long-lasting chassis protection by using

Texaco lubricants are used exclusively on the job by Merritt-Chapman & Scott.

Texaco Marfak. It doesn't pound or squeeze out. Wheel bearings get the same kind of protection from *Texaco Marfak Heavy Duty 2*. It seals itself in, seals out dirt and moisture, and needs no seasonal change. For transmissions and differentials, they use *Texaco Universal Gear Lubricant EP*.

Ask a Texaco Lubrication Engineer to work out a Texaco Simplified Lubrication Plan expressly for the problems of any job you're working on. Just call:

☆ ☆ ☆

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

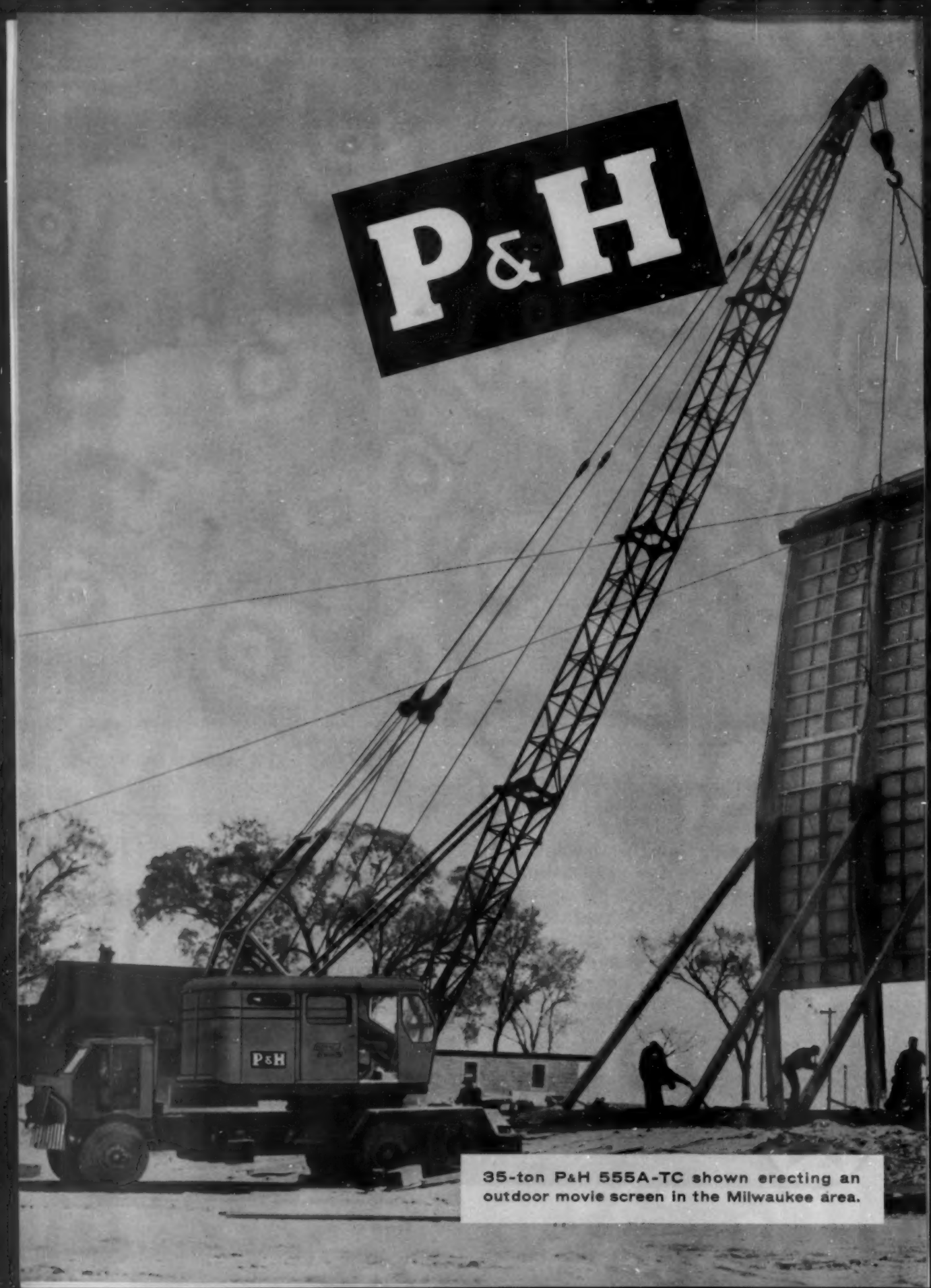
Huge dragline is one of several being used to build Priest Rapids Dam on Columbia River south of Vantage, Wash. All are kept operating at top efficiency with Texaco lubricants.

TEXACO

TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

. . . for more details circle 298 on enclosed return postal card



35-ton P&H 555A-TC shown erecting an outdoor movie screen in the Milwaukee area.

Get more "working days"

with the 35-ton P&H 555A-TC

In the 35-ton classification, there are more truck cranes with the familiar P&H trade mark than any other make—BY FAR!

An example of the P&H 555A-TC putting in more "working days" at a higher profit is the rig shown at left. Customers of John Hennes Trucking Co., Milwaukee, Wis., keep this 555A-TC constantly on the go . . . and it's always ready to go! It requires minimum maintenance. When replacements are needed, P&H parts service is prompt.

This profitable production is typical of P&H performance. It comes from such features as the P&H Planetary Boom Hoist. Lowering is always done under power and the boom can be safely held in any position. *The P&H Planetary Boom Hoist is a standard feature.*

Add to this exclusive feature the P&H alloy steel, open-throat booms that are lighter yet more rugged—the famed P&H all-welded construction —the superior live roller circle and you, too, will see why the P&H 555A-TC is the most popular truck crane in the 35-ton field.

Harnischfeger Corporation
Construction & Mining Division
Milwaukee 46, Wisconsin

THE P&H LINE Truck Cranes: 8, 10, 15, 20, 25, 30, 35 and 40 tons
Shovels: ½, ¾, 1½, 1¾, 2½ and 3½ yards

Across the country P&H machines lead the field in power, speed, flexibility and profitable performance

TEXAS
For handling loads up to 20 tons profitably there is the P&H 255A-TC. Here is Brown & Root's third Model 255A-TC shown at work on construction of off-shore drilling platform at their Marine Division Shipyard.

CONNECTICUT
Earthmoving Service & Equip. Corp., profits from the greater strength of the 2½ yd. P&H 955A in moving tremendous quantities of borrow. Job is part of new Connecticut Turnpike.

VIRGINIA
In the ¾ yard class, Commonwealth Sand & Gravel Co. of Richmond depends on the speed and accuracy of the P&H 255A for increased production. It is shown here equipped with 40 foot boom and ¾ yard clamshell bucket.

. . . for more details circle 268 on enclosed return postal card

Write today for Verified P&H Cost-Performance Facts

Harnischfeger Corporation, Dept. 502-E
Construction & Mining Division
Milwaukee 46, Wisconsin

Gentlemen:
Please send me field report No. 5504 on the 35-ton P&H 555A-TC.

*Name*_____

*Title*_____

*Firm*_____

*Street*_____

*City*_____ *Zone*_____ *State*_____

These TD-24 full-time

let you run power circles

Exclusive, all-weather, seconds-fast International gasoline coversion starting. Direct combustion heat conditions the TD-24's engine, seconds-fast—for full diesel performance. You avoid the warm-up delays and service complications of a surplus starting engine—earn money while "slow starters" are warming up!

Exclusive International Cerametallic-faced engine clutch action. The TD-24 is the only king-sized crawler with this big feature. Immune to heat and cold, this long-lasting clutch gives full-load power-transfer efficiency—anywhere, anytime! This dry-type clutch of simplified design eliminates "high frequency" servicing demanded by clutches with "cooling systems."

Exclusive, years-proved Planet Power steering. Why put up with load limiting "dead track drag" on the turns in a king-sized steering clutch crawler? Why not profit from TD-24 Planet Power steering that enables you to pull or push as big a load on the turns as on the straight-away? See how TD-24 two-track turning power never backs off from a load. "Take the turn" to new profits with Planet Power steering!

Exclusive cycle-speeding on-the-go shifting. In either Torque-Converter or Gear-Drive model, the TD-24 gives instant stall-preventing Hi-Lo shifting, without stopping or even declutching. Fingertip matching of speed to load under full power gets the job done sooner!

Exclusive TD-24 fingertip operating ease provides the operator comfort incentives and the means to give full days of full capacity cycle-speeding production!

Find out how these and all the other TD-24 production exclusives can equip you to run power circles around anything else on tracks. See your International Construction Equipment Distributor for a TD-24 demonstration!

Planet Power steering and Hi-Lo "power-crowd" keeps the TD-24 loading the "75" Payscraper® at top effective speed—adds up to increased daily yardage. Only 30 to 45 seconds needed to heap-load a "75" Payscraper—on this Dominic Leone Construction Co., Inc., Colorado road job!

production exclusives around "cycle-stallers"

Even with such offset loads as a boulder-bucking angled blade—benching a road round a hill—TD-24 Planet Power steering lets you concentrate the power where you want it. You stay on course—production stays up!

On slam-bang rock-dozing or moving other heavy materials, instant TD-24 Hi-Lo shifting adjusts tractor power to load resistance —increases production, avoids delay! And you get fast reversing to speed shuttle-dozing!

For more details circle 316 on enclosed return postal card

INTERNATIONAL® CONSTRUCTION EQUIPMENT

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

This heavily traveled U.S. highway has to stay open during the winter, no matter what the weather conditions! That's why straight Sterling Rock Salt is used for snow and ice control.

Straight Sterling Rock Salt Keeps This Road Open at Low Temperatures!

20° . . . 12° . . . 0°. Even at these temperatures, *your* roads can be clean and safe during winter storms. Straight Sterling Rock Salt will do the job!

Cities and highway departments across the nation's ice belt confirm this fact: Straight Sterling Rock Salt has effective melting power at temperatures ranging from 32° F. all the way down to below zero! It can be used for ice and snow control in any area—no matter how severe the weather. All that's necessary is to increase the amount of salt used at low temperatures—just as it's necessary to use more fuel to heat your home when it gets colder outside.

For example, many communities today use about one-third more Sterling Rock Salt when the temperature falls below 20°. And this provides a bare, safe pavement! By the same token, it's also possible to get bare-pavement safety on steep grades. Just use *more* Sterling Rock Salt as the grade increases.

How Sterling Rock Salt works. It helps turn snow into slush—quickly. And when ice forms, the salt crystals (with exclusive "Auger-Action") *bore through* the ice layer to the road surface. Here, brine is formed, breaking the bond between ice and pavement! In contrast, abrasives just can't do this job! They have no melting power . . . cannot provide the bare pavements so vital to traffic safety.

Finally, consider the economies of straight Sterling Rock Salt. This material has a low delivered cost . . . covers more road mileage than abrasives or salt-and-abrasive mixes . . . and dissolves with the snow and ice it melts. It leaves no time-consuming, costly clean-up jobs!

REMINDER: You can protect rock salt from caking in storage with new Sterling Storite. This remarkable chemical keeps salt free-flowing, ready for immediate use. Send for free booklet giving full details.

International Salt Co., Inc.

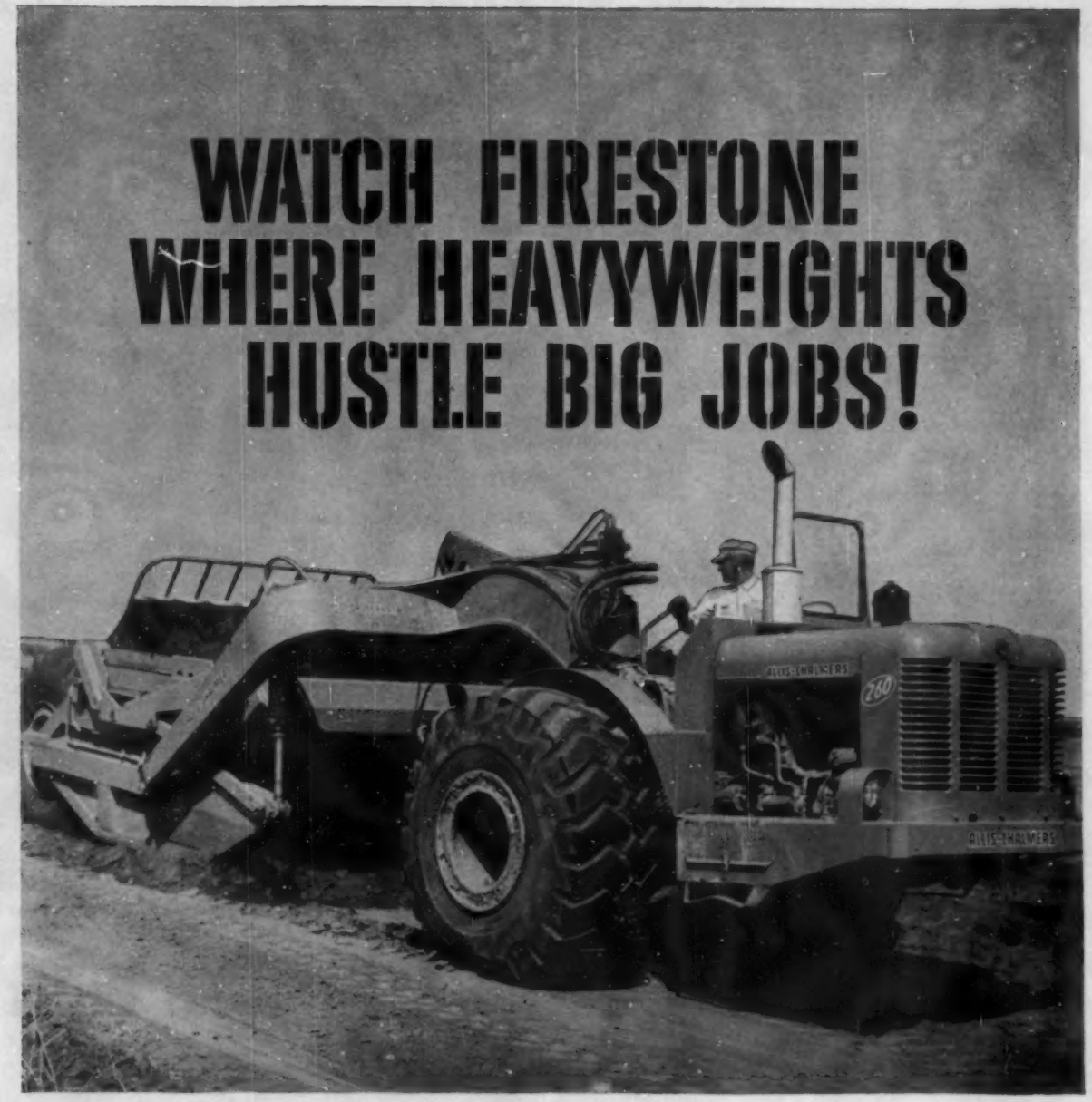
SALES OFFICES: Atlanta, Ga.; Chicago, Ill.; New Orleans, La.; Baltimore, Md.; Boston, Mass.; Detroit, Mich.; St. Louis, Mo.; Newark, N. J.; Buffalo, N. Y.; New York, N. Y.; Cincinnati, O.; Cleveland, O.; Philadelphia, Pa.; Pittsburgh, Pa.; Memphis, Tenn.; and Richmond, Va.

STERLING "AUGER-ACTION" **ROCK SALT**

INTERNATIONAL SALT COMPANY, INC., SCRANTON, PA

. . . for more details circle 270 on enclosed return postal card

WATCH FIRESTONE WHERE HEAVYWEIGHTS HUSTLE BIG JOBS!



Firestone Rock Grips fit your machinery to any job condition

Firestone Tubeless Rock Grips let you roll the big loads out ahead of schedule. Two great tread designs combine traction and toughness to move your heavyweights over any terrain without changing tires to match each job. You get the *full flotation* you need for sand and soft stuff. You get the *armored grip* you need for rough runs over splintered rock or shale. Safety-Tensioned *Gum Dipped*® NYLON bodies and cut-resistant treads defy gashes and bruising impacts—make Firestone the top choice of off-the-highway users. Your Firestone Sales Engineer will show you why you'll make them your top choice, too. Contact him today through your local Firestone Dealer or Store.

ROCK GRIP WIDE BASE ROCK GRIP

Enjoy the Voice of Firestone on ABC television every Monday evening.

Firestone

Copyright 1957, The Firestone Tire & Rubber Company

BETTER RUBBER FROM START TO FINISH

. . . for more details circle 238 on enclosed return postal card

New light-duty Apache—Series 31 pickup *New Step-Van—One of three new Forward Control models in Apache Series*

NEW 1958 CHEVROLET TRUCKS WITH

Just look at all they offer that's new and better . . . and you'll see why these new Chevies are the fleetest, sturdiest, handsomest dollar-savers yet! Meet Chevrolet for '58!

THREE NEW MODEL LINEUPS!

It's the biggest, most versatile Task-Force fleet yet —with an appetite for work to match! Every model sports fresh, broad-shouldered styling. And there's new hard-pulling power in every weight class, too—from the handy, handsome pickups to strapping tandems with GCW ratings all the way up to 50,000 lbs.

Just name your job. Your Chevrolet dealer will gladly name the new Apache, Viking or Spartan model to do it faster, easier and more economically than any other truck on the road!

NEW LIGHT-DUTY APACHES

Nifty, thrifty Apaches—built to outwork anything in their weight class—offer three completely new

SEE THE LATEST EDITIONS OF THE "BIG WHEEL" IN TRUCKS—

New heavy-duty Spartan—Series 90, L.C.F. model *New medium-duty Viking—Series 60 cab and chassis*

NEW HUSTLE! NEW MUSCLE! NEW STYLE!

Step-Vans equipped with walk-in bodies. The expanded lineup also includes high-capacity panels, pickups and four-wheel drive trucks—with a model tailored to take on your most troublesome delivery chores. There's new pep and power in any engine you pick, too—whether it's a 6 famous for economy or a short-stroke high-compression V8.

NEW MEDIUM-DUTY VIKINGS

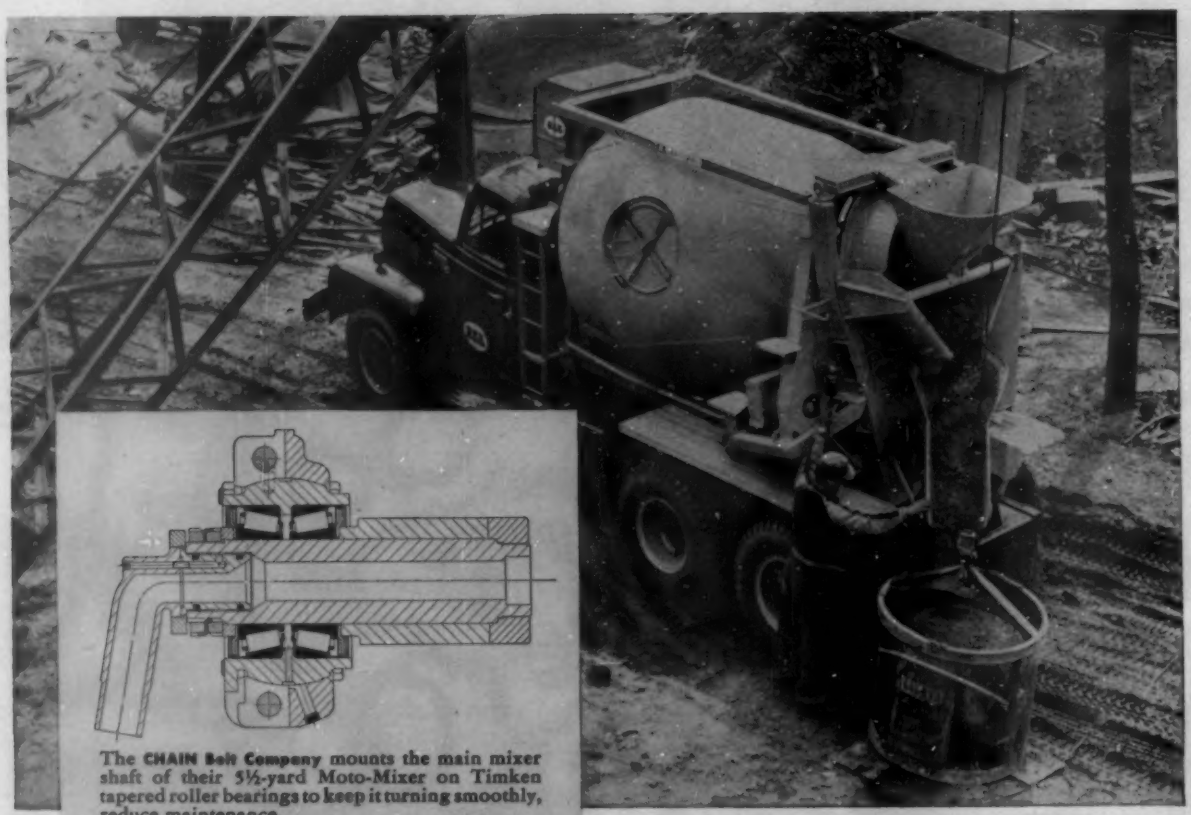
Hardy, hard-working Vikings roll in with nine brand-new models, offering new cab-to-rear-axle dimensions for improved semi-trailer, dump, stake and van-type operations. Options available on these and most other new models boost GVW ratings all the way to 21,000 lbs.—as high as many competitive heavyweights. Yet you get traditional Chevrolet economy from high-compression engines that include the industry's most popular 6's and V8's packing up to 175 h.p.

NEW HEAVY-DUTY SPARTANS

The robust Spartans make hauling history with the most revolutionary truck engine in decades—the Workmaster V8 with Wedge-Head design. The combustion chambers are in the cylinder block! Featured in Series 90 and 100 heavyweights, this 230-h.p. engine achieves a new high in efficiency. There's also an 18,000-lb. rear axle to go with it, an optional high-tonnage 9,000-lb. front axle and cast-spoke wheels on every model. Look over Task-Force 58 at your Chevrolet dealer's. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

1958 CHEVROLET TASK·FORCE TRUCKS! CHEVROLET

... for more details circle 322 on enclosed return postal card



The **CHAIN Belt Company** mounts the main mixer shaft of their 5½-yard Moto-Mixer on Timken tapered roller bearings to keep it turning smoothly, reduce maintenance.

Larger payload without exceeding wheel load limits; mixing drum rolls on TIMKEN® bearings

THIS 5½-yard Rex Adjusta-Wate Moto-Mixer is designed with great attention to correct weight distribution. And Timken® bearings play a big role in the CHAIN Belt Company's claim of "More loads per truck per day—and larger payloads without exceeding wheel load limits". A huge part of the load is in the mixing drum itself where ruggedness counts. This drum is mounted entirely on Timken tapered roller bearings, front and back, for free rolling, longer wear, less maintenance.

The drum shaft is mounted on Timken bearings, too, preventing misalignments which would otherwise occur with the Rex Adjusta-Wate Moto-Mixer operating off-level or going over rough ground. The tapered construction of Timken bearings lets them take radial and thrust loads in any combination and Timken bearing rollers and races have full line contact, which means extra load-carrying capacity. What's more the severe shocks encountered are easily met by Timken bearing *case-carburized* rollers and races; hard, wear-resistant surfaces over tough, shock-resistant cores.

In addition, Rex Moto-Mixers also use Timken bearings to good advantage in the clutch drums, secondary shafts, and in the new, improved water pump—with the pump driven by a V-belt directly from the engine crankshafts. Timken bearings are geometrically designed to give true rolling motion, practically eliminating friction . . . precision-made to conform to their design. To insure highest quality, we even make our own steel, which no other American bearing manufacturer does.

Look for the trade-mark "TIMKEN" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

TIMKEN *TAPERED ROLLER BEARINGS ROLL THE LOAD*

TRADE-MARK REG. U. S. PAT. OFF.

See the next Timken Televent hour, "The Innocent Years" over NBC-TV, Thursday night, November 21st.

. . . for more details circle 301 on enclosed return postal card

ROADS AND STREETS
Sixty-Five Years of Editorial Leadership

Washington News Letter

By Duane L. Cronk

November 10, 1957

National Highway Program scoreboard:

State contract lettings: Up 26%

Nearly $2.4 billion worth of construction contracts has been let by state highway departments so far this year (first 8 months). This healthy increase was sparked by an 83% increase in funds from the federal government.

- Interstate System projects account for $665 million of the total, compared to $195 million in the same period last year, before the big push got under way.

- Work on other federal-aid systems - secondary, primary, and urban - has not been sidetracked for the big Interstate projects where Uncle Sam picks up 90% of the tab. It is reassuring to note that contract awards for the "ABC" systems are actually up 6% ($972 million, compared to $915 million).

* * *

It is not reassuring to note that the states are easing off construction outside the federal-aid program. The big Federal Highway Act of 1956 was expected to spark a $100 billion roadbuilding program, of which $50 billion would be in federal money plus state matching. It was widely predicted that the states, the counties, and the cities would provide the other $50 billion under their own financing.

In order for these units to assume that much of the total volume, however, it will be necessary for them to step up their expenditures considerably. This step-up will have to be adequate (1) to offset the impending drop next year in toll road construction (which is accounting for $2 billion worth of work in 1956 and 1957) and (2) to show a steady, significant net gain.

Instead, state non-federal contract awards are down 10%, from $455 million to $410 million. ARBA and a few optimistic others insist that, in time, public opinion will force the states (and cities and counties) to spend more of their own money for local roads and for connections to the big Interstate routes. They believe that the impressive new federally-financed superhighways will become so popular that local taxpayers will be willing to float municipal county and state bond issues or boost their gasoline taxes to provide some of their own.

* * *

The obvious moral is that there's plenty of homework yet for good roads advocates who still believe this country needs $100 billion worth of new highways. No one can be unhappy with the 26% over-all increase in state lettings,

(continued on next page)

which is quite in line with expectations. But to those who feel that non-federal-aid work will automatically keep pace with the federal-aid program, the following set of figures must come as a jolt:

Federal-aid state contract lettings - Up 47%
Non-federal-aid state contract lettings- Down 10%

* * *

Three states have asked the federal government to step in and help them acquire rights of way for Interstate System projects. Maryland, Illinois and Washington are the first states to invoke the powers which Congress granted the Bureau of Public Roads 16 months ago - that of using federal condemnation authority to acquire land if a state could not do so. In the case of Maryland, the highway department appealed for assistance because it does not have the manpower to do the job. Illinois and Washington are being hamstrung by inadequate acquisition laws.

(The Bureau has approved state plans to acquire $660 million worth of right of way thus far under the National Highway Program, compared to $1,257 million authorized for contract construction.)

* * *

Some 2,102 miles in new routes were added to the National Interstate System last month. Highway officials and contractors in the many states involved were delighted to hear the news. The designation includes not only the 1,000 additional miles authorized by Congress but another 1,102 miles made possible by savings in mileage realized by more direct location of routes previously designated. Some of the major projects which will now become eligible for 90% federal money are:

- A 547-mile highway between Denver and Cove Fort, Utah.
- A 431-mile highway between Canton, Ohio, and Charlotte, N.C.
- A 230-mile highway between Fargo, N.D., and Sioux Falls, S.D.

Other additions include 170 miles between Nashville, Tenn., and Cairo, Ill.; 143 miles between San Antonio and Corpus Christi, Texas; 102 miles between Pittsburgh and Erie, Pa.; and 132 miles between Ellensburg, Wash., and Pendleton, Oregon. Urban connections were approved in a score of big cities.

* * *

There is more and more talk of using highway funds to aid mass transportation systems. Some are asking that the highway program include separate roadways for transit or buses in urban areas, or provision for mass transit on expressway rights of way. Last month, the Los Angeles Metropolitan Traffic Association recommended the construction of elevated roads for the exclusive use of express motor coaches, above existing and proposed freeways. The two-lane structures would run 10 miles out from the downtown area, would cost an estimated $2 million a mile.

* * *

A Chicago transit commissioner urged a special congressional committee last month to re-define the use of federal-aid highway money so it could be used for mass transportation systems. And the new mayor of Detroit appealed to large cities to unite in such a push. Highway leaders here look for this to be one of the liveliest issues of the coming Congressional session.

You owe yourself a close-up look at the new Allis-Chalmers HD-21...and a working demonstration of.....

NEW live power FOR BIG JOBS

This is *live* power! Allis-Chalmers' new turbo-engine delivers 225 net *usable* horsepower. Hydraulic torque converter drive puts this power to work—automatically provides the *right pull* or *push* for every load, at the *maximum travel speed* for existing conditions. New, longer track provides outstanding traction, flotation and balance.

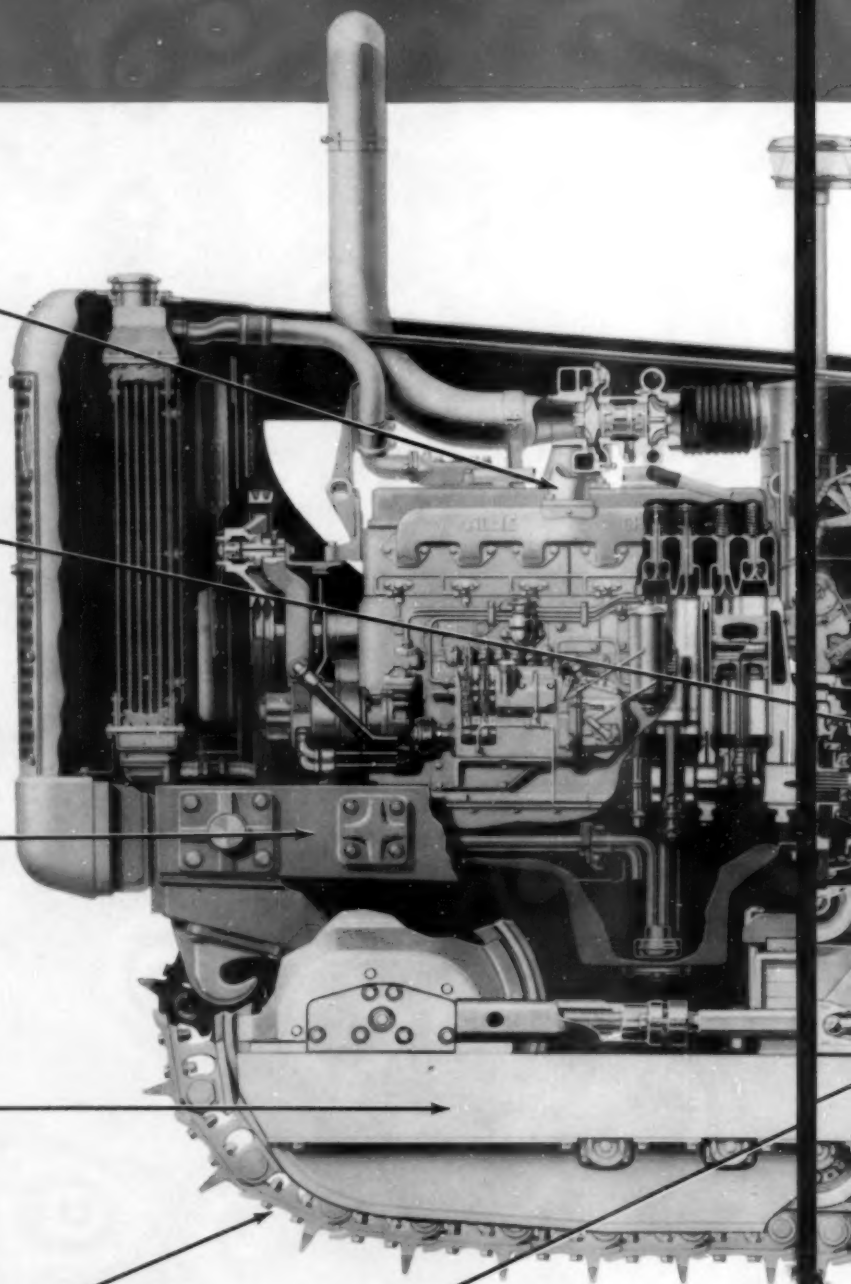
Ask the men who own or operate the new high-production HD-21. On jobs that really put a tractor to the test, they all like the responsive way it handles, the way it moves into the dirt fast and *keeps moving* in toughest going.

The Allis-Chalmers HD-21 offers you more *working tractor ability*—dollar for dollar—than any other big crawler tractor you can buy. Just *compare* and you'll agree!

NOW... LOOK AT THE INSIDE VALUES that make this tractor so productive

NEW ALLIS-CHALMERS HD-21

strength scaled



New turbo-engine brings extra power, cleaner operation, new fuel economy, and longer life through controlled combustion, full-pressure lubrication, three-way filter protection.

Torque converter drive—means more production *automatically* . . . also lengthens life of power train, entire tractor and its equipment through hydraulic shock cushioning. And Allis-Chalmers gives you the benefit of *16 years'* experience in torque converter tractors.

Unit construction, time-saving serviceability with Box-A Main Frame design . . . let you remove engine, clutch, torque converter, transmission or steering clutches without disturbing adjacent units.

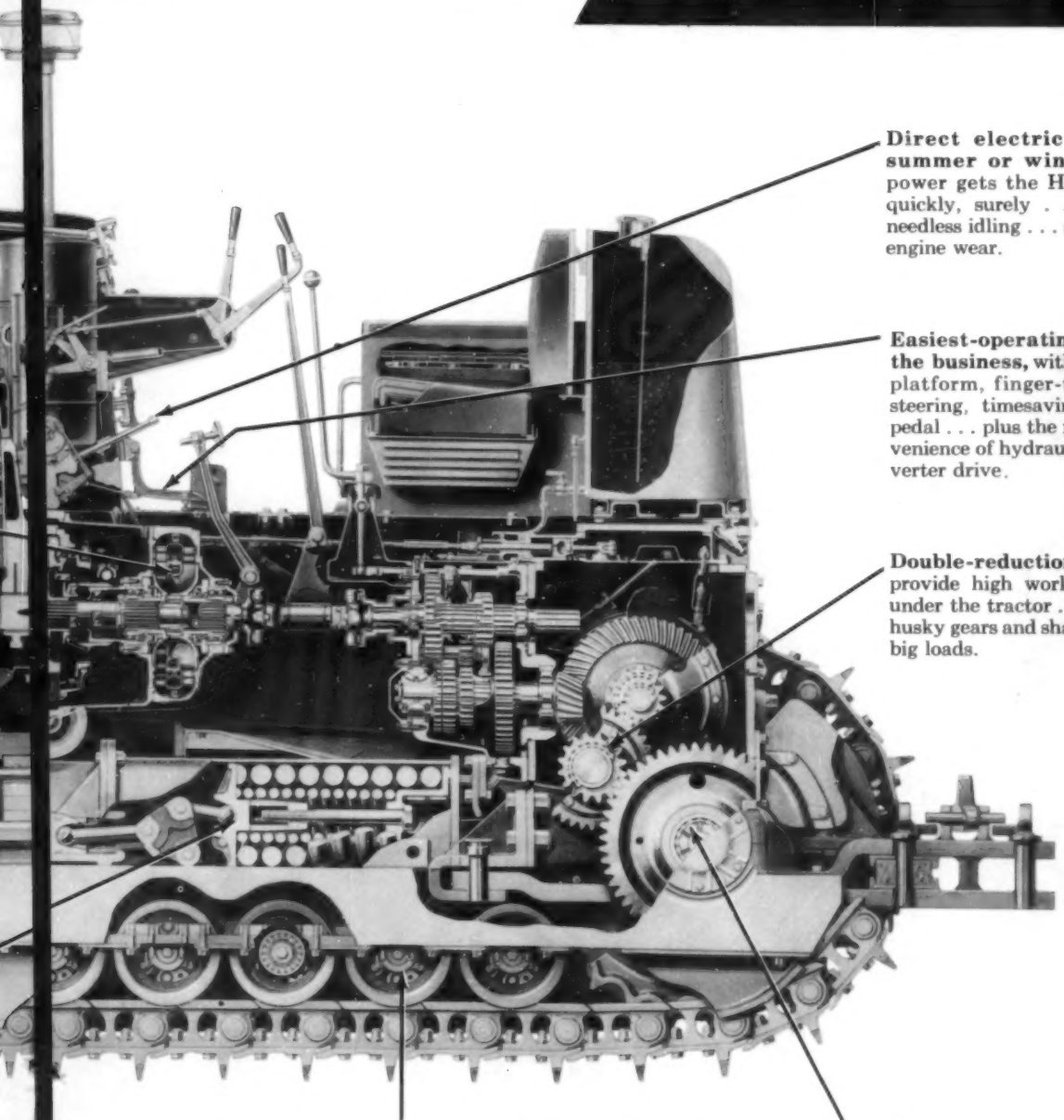
Cost-cutting alignment—Heavy-duty truck frames of special high-strength steel keep tracks, idlers, rollers and sprockets riding true for longer, dollar-saving life.

Toughest track you can buy—True-dimension machining and heat treating in the industry's most modern facilities insure outstanding wearability under severe job conditions.

Oil-enclosed track "safety valve" prevents jamming when rocks or other material get into tracks. It's reliable and requires practically no maintenance.

to big jobs...

plus matchless service ease



Direct electric starting—summer or winter—24-volt power gets the HD-21 rolling quickly, surely . . . eliminates needless idling . . . saves fuel and engine wear.

Easiest-operating tractor in the business, with clean, roomy platform, finger-tip hydraulic steering, timesaving decelerator pedal . . . plus the matchless convenience of hydraulic torque converter drive.

Double-reduction final drives provide high working clearance under the tractor . . . also permit husky gears and shafts for today's big loads.

Easy-rolling, easily maintained truck wheels—With Positive Seals and tapered roller bearings, the HD-21's truck wheels, idlers and support rollers ride freely on the track to deliver more usable horsepower . . . need lubrication only once every 1,000 hours to give you more production hours.

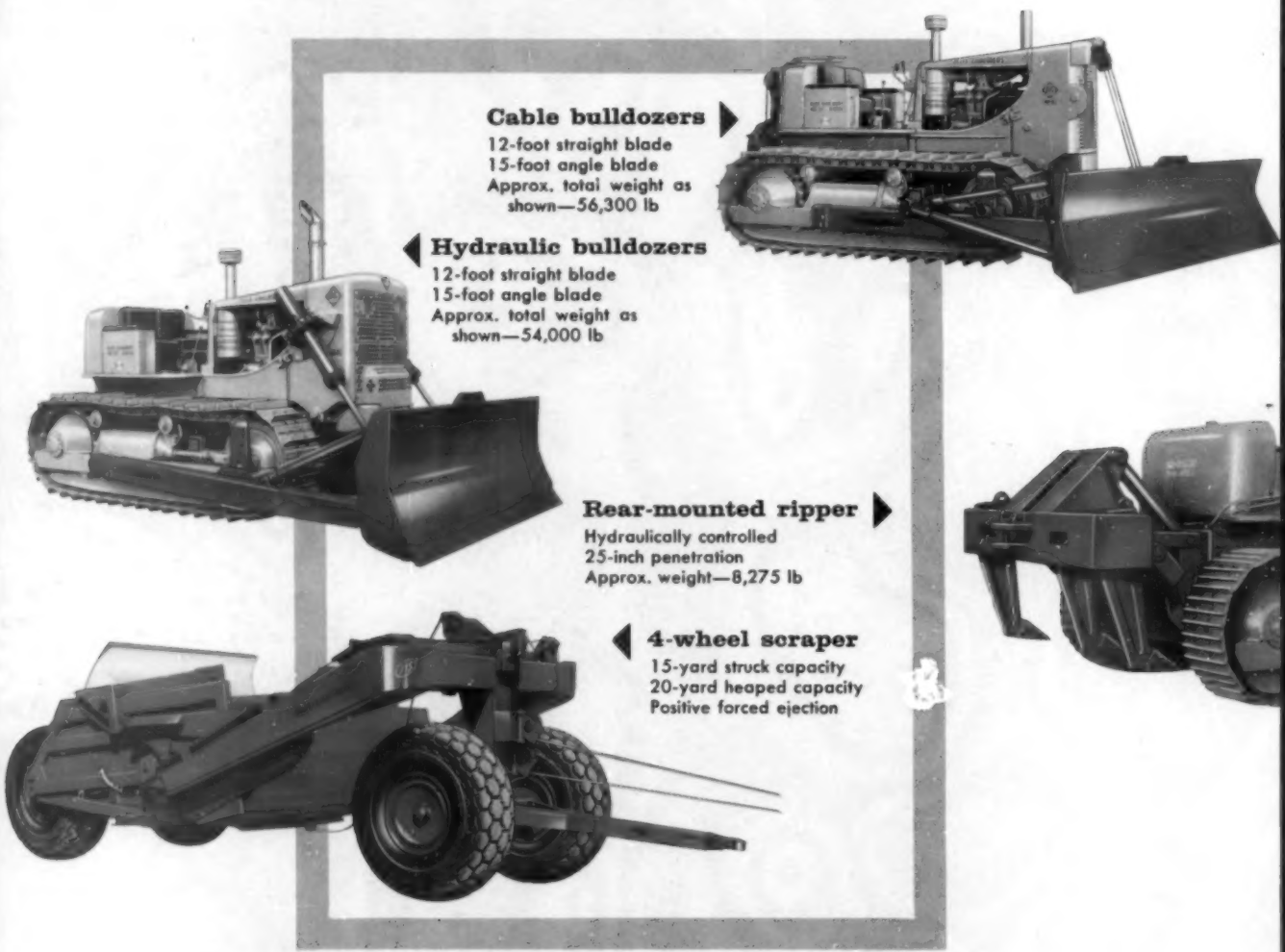
Straddle-mounting of all final drive gears—with tapered roller bearings on both sides . . . mounted in a one-piece, line-bored housing that insures constant alignment, longer gear life.

HERE'S

heavy-duty equipment

MATCHED TO THE NEW HD-21

. . . and to big-tractor jobs!



Cable bulldozers
12-foot straight blade
15-foot angle blade
Approx. total weight as shown—56,300 lb

Hydraulic bulldozers
12-foot straight blade
15-foot angle blade
Approx. total weight as shown—54,000 lb

Rear-mounted ripper
Hydraulically controlled
25-inch penetration
Approx. weight—8,275 lb

4-wheel scraper
15-yard struck capacity
20-yard heaped capacity
Positive forced ejection

You owe yourself a close-up look at the new HD-21. Your Allis-Chalmers dealer will be glad to demonstrate its live-power performance . . . and to prove it can help you on your big jobs.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

Engineering in Action

LITHO IN USA D&J

Just how effective are rubber-alloyed seal coats?

WE THINK you'll be pleasantly surprised at how effective seal coats can be *when* the binder is alloyed with RUBARITE. Let's take the case of the county road in a prominent Western state (pictured at left) as an example.

As you can see, the road surface was in poor condition. So poor, in fact, that the county officials decided upon a seal coat only as a temporary measure—planned to rebuild the road the following year. However, as an experiment, they put down an asphalt cement reinforced with RUBARITE.

RUBARITE is a powder of unvulcanized synthetic rubber combined with minute particles of a special carrier. It not only handles easily, but disperses rapidly and thoroughly in asphalts or cut-backs with these results: Substantially increased toughness or strength. Much greater, longer-lived adhesion. Much improved ductility and flexibility. Considerably less susceptibility to heat, cold and oxidation.

During application of the RUBARITE asphalt cement the officials were well pleased with the way it spread and penetrated the many checks and cracks. They were even more pleased with the thick mat and excellent early adhesion that resulted, particularly on one stretch of road where there was a four-hour delay in placing the stone with the air temperature about 50-55°F.

Their greatest satisfaction came a year later, however, when they inspected the job after a particularly wet winter. The surface was in such good condition that plans for rebuilding were dropped. Instead, it was decided to insure the serviceability of the road for years to come with another RUBARITE seal coat.

This project is just one of a number of cases in our files which fully prove the effectiveness of seal coats made with RUBARITE. If you'd like to see the further evidence, just write to: Rubarite, The Goodyear Tire & Rubber Company, Akron 16, Ohio.

RUBARITE by GOODYEAR

THE GREATEST NAME IN RUBBER

Rubarite—T.M. The Goodyear Tire & Rubber Company, Akron, Ohio

. . . for more details circle 291 on enclosed return postal card

Secondary Road Plan Follows State-Wide Needs

A new procedure in North Carolina for the development of secondary road plans, county by county on state-wide basis of need, were recently approved by the state highway commission. The job is to be completed by midyear 1958. This state department has charge of many lesser roads which in other states are under county direction.

The first step will be to determine total state-wide needs for general improvements, paving, realignment and new construction.

The procedures adopted by the commission outline allocation methods to be followed, minimum and desirable levels of service for secondary roads, and administrative procedures to be followed by boards of county commissioners, highway employees and the general public. Copies of the specific procedural steps to be followed are being sent to all county commissioners.

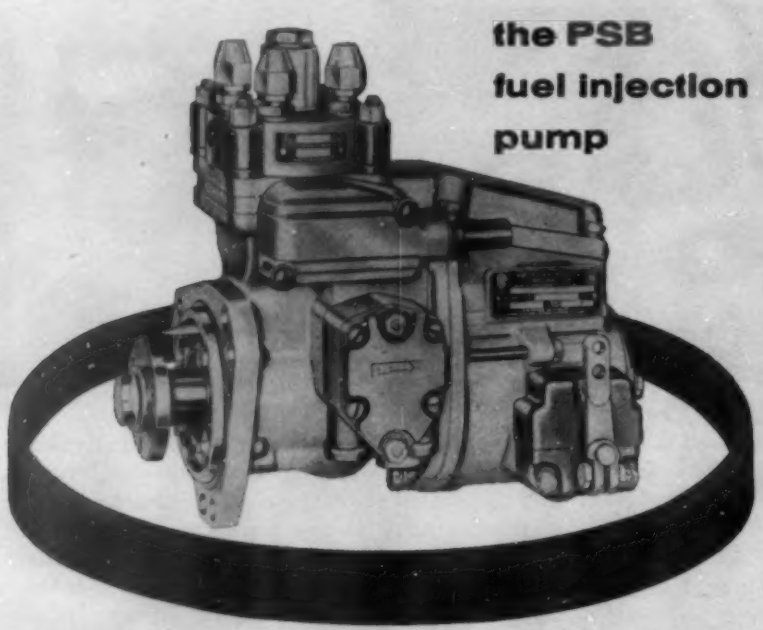
The survey will determine the cost of bringing these facilities up to a minimum or acceptable level of service. In mountainous areas, this minimum service level is designed to provide a traveled way on all roads at least 12 ft. wide and a surface of 4 to 6 in. of granular material. Minimum travel way is 18 ft. elsewhere with at least 2 in. of granular material. Drainage and minimum bridge widths and load capacity are items also specified.

Under the "desirable level of service" standard, all rural roads with average traffic volumes in excess of 50 vehicles per day are to be considered for paving. Each rural secondary road carrying such traffic will be rated on the basis of its (1) land use characteristics, (2) its public service characteristics, and (3) its traffic characteristics.

New Catalog for Cleveland Institute of Radio Electronics

Cleveland Institute of Radio Electronics, 4900 Euclid Ave., Cleveland 3, Ohio, announces publication of a completely new brochure and course outline, bringing electronic industry employment requirements and opportunities up to date.

Employers of technical electronics personnel have long been aware that the successful employe must have a thorough understanding of fundamentals. The new brochure presents the subject from the viewpoint that true technical competence in electronics is necessary to guarantee success in such a rapidly changing field. A copy of this brochure may be obtained without charge.



the PSB fuel injection pump

TOP VALUE

. . . *from outstanding performance*—proven by the unexcelled service records of the more than 140,000 American Bosch PSB pumps now in use.

. . . *from outstanding design*—featuring simple construction with fewer parts . . . positive governor control . . . precise fuel metering and distribution . . . replaceable hydraulic head for fast field servicing.

. . . *from unmatched operating economy*—efficient design and careful manufacture assure top diesel engine performance . . . long, trouble-free operation with minimum maintenance and repair.

. . . *from low-cost repair service*—by factory-trained experts at Authorized American Bosch Service Stations . . . nearly 200 in North America, Hawaii, and Puerto Rico . . . all equipped with special tools and test equipment, and stocked with genuine American Bosch replacement parts.

4867

AMERICAN BOSCH
DIVISION
AMERICAN BOSCH ARMA
CORPORATION
SPRINGFIELD 7, MASS.

. . . for more details circle 236 on enclosed return postal card

This Month's Cover

Pictured on the cover of *Roads and Streets* this month is a Pioneer plant assembly owned and operated by Pickitt and Schreur, contractors, of Allegan, Mich. This firm of specialists in rock and gravel production produces washed concrete materials at the rate of 140 tons per hour, this assembly also including an Eagle washer.

Power units are GM Detroit Diesel 6-71s. This plant is indicative of the possibility of high volume production in a stationary or at least long-time set-up in a commercial quarry with equipment which is still capable of being transported on its own rubber or in disassembled units to various other locations.

now, in contractor tools, too,

if it's Remington, it's right!

Power operating efficiency assured by direct gear transmission.

Lifting eye provides safe, easy way to move trowel from floor to floor.

12 outstanding features make the TG4 the most efficient power trowel ever designed!

Model TG4 Power Trowel. 2½ hp., 4-cycle, 1 cylinder, air cooled gasoline engine; dust and moisture proof magneto, adjustable governor; available with 28" ring (TG4-28) or 36" ring (TG4-36).

These twelve features make the Remington TG4 Power Trowel by Mall the most advanced on the market. Hundreds of contractors already know it as the finest performing, easiest to handle, most versatile gasoline driven troweling machine they have ever used. Here are the twelve features. Compare them with other makes!

1. **Powerful 4-cycle, air cooled, 2½ hp. gasoline engine for fast, steady finishing.**
2. **Direct gear transmission delivers 87% of power to blade. No slipping belts to steal valuable power and reduce efficiency.**
3. **Lifting eye for raising or lowering machine from floor to floor.**
4. **Automatic recoil starter—fast, easy—no lost rope, no waste of time.**
5. **Exclusive! Quick-kick pitch adjustment ring. All three blades adjust at once. No bending—just a kick of the foot does it!**
6. **Low center of gravity design for easy operation.**
7. **Centrifugal clutch—engine disengages at idling speed. Promptly engages as engine speed increases.**
8. **Reversible shoes and blades of high-grade steel. Both edges can be used, giving double wear!**
9. **Extra strong ⅝" diameter, solid ring in 28" and 36" sizes.**
10. **Clamp ring for switching to a replacement engine in seconds. No belts, nuts or bolts to bother with!**
11. **Safety throttle control. Release handle and ring stops, engine idles. No stalling—no restarting necessary.**
12. **Floating disc attachment to smooth dry tamp floors (minimum water content) and grinding-grouting head to dry grind or wet grout concrete floors can be quickly and easily mounted in blade arm sockets.**

Only the Remington TG4 by Mall has all these advanced, time-saving features! And the TG4 is built with the quality and precision that have made Remington famous for 141 years in sporting firearms and ammunition.

For full information about the complete Remington line of Mall contractor and industrial tools, including concrete vibrators, earth augers, circular saws and many others, just send the convenient coupon.

Remington

Mall®

MALL TOOL COMPANY
Division of Remington Arms Company, Inc.
Bridgeport 2, Connecticut

Mall Tool Company,
Division of Remington Arms Company, Inc., Dept. RS-11
Bridgeport 2, Connecticut

Please send free catalog on contractor and industrial tools.

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

. . . for more details circle 282 on enclosed return postal card

Step in...NEW '58

NEW TILT CAB TRUCKS . . . lowest-priced* Tilt Cab line in America! Six new series, up to 60,000-lb. GCW, are typical of the wide choice in Ford's heavy duty line.

*Based on a comparison of manufacturers' suggested retail prices

(Background) **NEW TWO-TON** stake with your choice of Short Stroke Six or V-8's.

NEW '58 FORD PICKUP. Modern Styleside body is as wide as the cab and *standard at no extra cost!*

Step ahead... with all

Meet America's newest, most modern trucks—Ford for '58! Discover the new advances in this pace-setting line. See the important advantages that help you do your job better and at lower cost!

Then match your specific requirements against Ford's over 300 new models. Whatever your need—from half-ton pickup to heavy duty tandem—Ford's got it! And *you'll* get a truck that costs you less to own, less to run and lasts longer, too.

So see your Ford Dealer today and step ahead with America's most modern truck—built modern to cost you less.

NEW CAPACITY! Extra-wide Styleside pickup bodies have up to 41% more loadspace than others . . . *biggest loadspace per dollar!*

NEW SAVINGS! Only Ford offers this modern, extra-capacity pickup body *at no extra cost!*

NEW EASY RIDE! Scientific Impact-O-Graph ride tests prove amazing superiority of Ford over competitive pickups—a ride mighty close to that of a car!

NEW POWER! More powerful, more rugged V-8 engines! And only Ford offers Short Stroke economy in *both* Six and V-8!

'58 FORD TRUCKS—FIRST WITH THE FEATURES THAT COUNT!

FORD TRUCKS

that's new...costs less, too!

NEW SAFETY! "Safety Vision" dual headlights . . . Lifeguard steering wheel . . . double-grip door locks, standard equipment on Ford trucks!

NEW "FINE CAR" CONVENIENCES! Ranchero offers all power assists, including power windows. You can even get factory-installed air conditioning at Ford's low prices.

NEW COMFORT! Only Ford truck Driverized Cabs have this comfort combination: woven plastic upholstery, non-sag seat springing, suspended pedals and weather-protected inboard steps.

NEW TILT CAB SAVING! Hundreds of dollars less than other Tilt Cabs . . . America's lowest-priced* Tilt Cab line.

The big fleets buy more Ford Trucks than any other make!

FORD TRUCKS COST LESS

LESS TO OWN . . . LESS TO RUN . . . LAST LONGER, TOO!

. . . for more details circle 262 on enclosed return postal card

Personals

L. R. Howson Elected President of ASCE for 1958

L. R. Howson has been elected president of the American Society of Civil Engineers for 1958. Howson who is a consulting sanitary engineer in Chicago, as senior partner in Alvord Burdick Sons, succeeds Mason G. Lockwood of Houston, Texas.

Vice-presidents elect of ASCE are Waldo G. Bowman, New York, editor of Engineering News-Record, and Samuel B. Morris, of Los Angeles, consulting engineer.

Paul F. Royster is named assistant commissioner for operations, Bureau of Public Roads, Washington, D.C. He succeeds A. C. Clark, who recently retired. Mr. Royster, who will direct several major Bureau activities involving construction and maintenance and engineering development work, is a former railway executive, and for a time was director of the Office of Transportation, Commerce Department, and assistant to the undersecretary for transportation of that department.

Lowell O. Stewart, head of the Civil Engineering department of Iowa State College, died recently. During his 33 years as a staff member, he held various positions including acting dean, and was the author of many articles in technical and educational journals and of tests on land surveying.

Lowell O. Stewart

Edward J. McGinnis has been appointed to the newly created position of an additional assistant district engineer for the New York State Department of Public Works, in the New York metropolitan area. He will divide time between Babylon, the district headquarters and the State Office Building at 270 Broadway.

Col. Charles T. Tench has been made vice-president of Palmer and Baker, Inc., in charge of Louisiana and Texas operations for this firm of consultants. He was formerly district engineer of the Corps of Engineers at New Orleans, and recently was an executive in the headquarters' staff of the firm.

George J. Dietle has been made chief engineer of the Wayne County (Detroit) Michigan Road Commission. He is a career man with the commission having served it since 1924.

Louis C. Litzner, Jr., Road Superintendent of Mackinac County, Michigan, has been elected president of the Upper Peninsula Road Builders Association.

LIMA ROADPACKER . . .
The cost-cutting vibratory compactor— proved on turnpike jobs

This is the hard-hitting, high-capacity machine that penetrates deeper—finishes a 13' width in one to three passes.

On this Ohio Turnpike job near Cleveland, Ohio, the LIMA Roadpacker is compacting a bank run gravel sub-base to an 8" high-density thickness. The LIMA Roadpacker's maneuverability was demonstrated efficiently on this job which required compacting operations in widely scattered sections—the problem of transporting cumbersome equipment and the duplication of units was eliminated.

Course aggregate for macadam bases up to 12" thick can be spread in a single layer, then uniformly compacted to final density over a 13'-1" width with the LIMA Roadpacker.

Single spread, which is permissible only with the vibratory method, reduces material handling by one-half or more—it eliminates backtracking of spreading equipment and contour shaping is needed only once.

The action of the vibration "runs in" screenings to full depth of macadam with only three operations. Much of the labor formerly required to spread, broom and roll is eliminated. The versatile LIMA Roadpacker performs with equal efficiency on both full-width and widening jobs.

Here's how the LIMA Roadpacker speeds up paving operations.

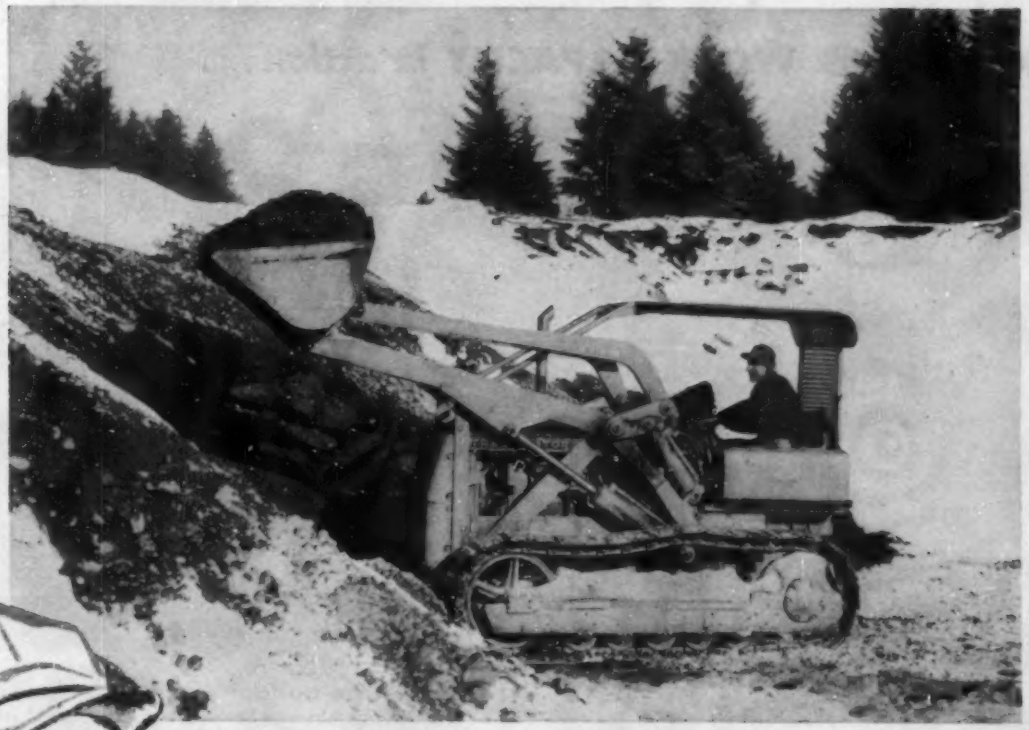
- Drives to job at 30 MPH.
- Compacts equally well traveling forward or reverse—no deadheading or turning around when two passes are required.
- Covers a 13'-1" width, one-half of a two lane road.
- Operator can easily fold end shoes for narrower working widths or for highway travel. Shoes are raised and lowered hydraulically.
- Low maintenance—all working parts are completely enclosed, can even operate under water or dirt. Shoes are driven hydraulically and are pressure-lubricated.

A fact-filled 4-page folder tells how the new LIMA Roadpacker will help you make more paving profits. Write for your copy today.

LIMA SHOVELS • CRANES DRAGLINES • PULLSHOVELS — **BALDWIN-LIMA-HAMILTON** Construction Equipment Division — LIMA WORKS

OTHER DIVISIONS: Austin-Western • Eddystone • Electronics & Instrumentation Hamilton • Lima-Hydropress • Madsen • Pelton • Standard Steel Works

. . . for more details circle 239 on enclosed return postal card



Start to go at 40 below... *FAST!*

SINCLAIR LEADS THE WAY IN SOLVING COLD WEATHER STARTING PROBLEMS

Now there's no longer any need to lose time, man-hours and money due to faulty cold weather starting. Sinclair has what you need to get going – in a hurry!

SINCLAIR STARTING FLUID permits trigger-quick ignition and smoother sustained burning, eliminates the possibility of detonation.

AMPCO-SINCLAIR ENGINE STARTER eliminates the need for "operator know-how"– *automatically* injects the right amount of starting fluid at the right rate of fluid flow for any engine, regardless of design, size or temperature.

ON-THE-JOB ENGINEERING SERVICE Trained, experienced Sinclair engineers are ready to help you at all times keep your equipment working on the job.

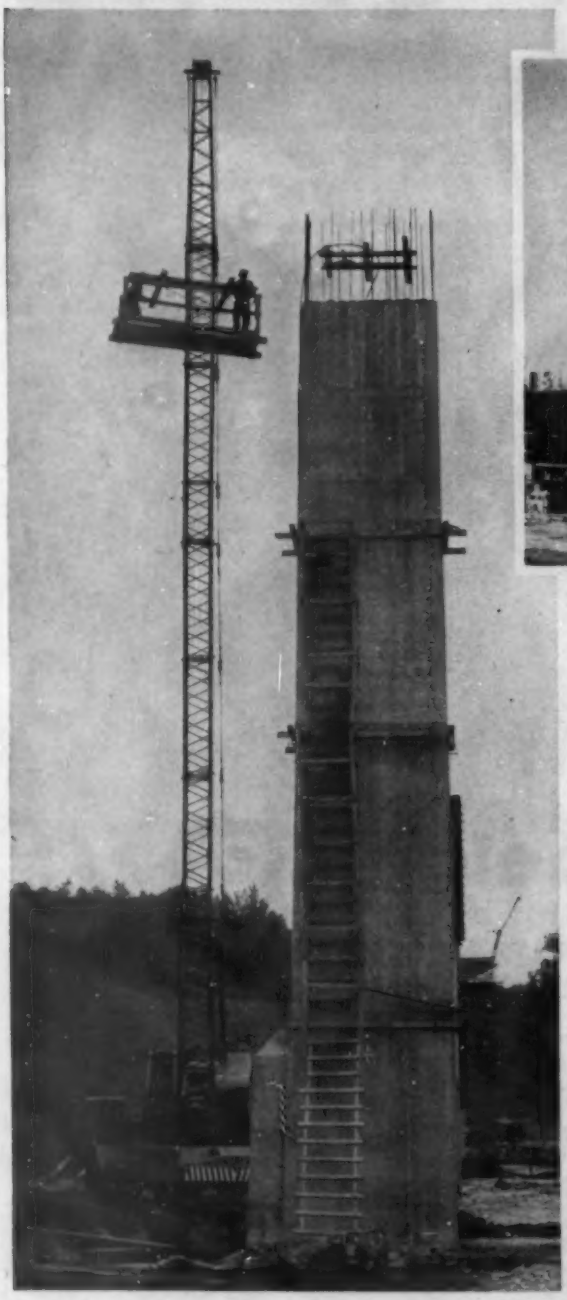
HIGH-QUALITY FUELS AND LUBRICANTS For easy starting and full anti-wear protection under sub-freezing conditions, you can depend on Sinclair quality products such as – H-C Gasoline, Diesel Fuels, TENOL® Motor Oils, LITHOLINE® Multi-Purpose Grease and OPALINE® Multi-Purpose Gear Lube.

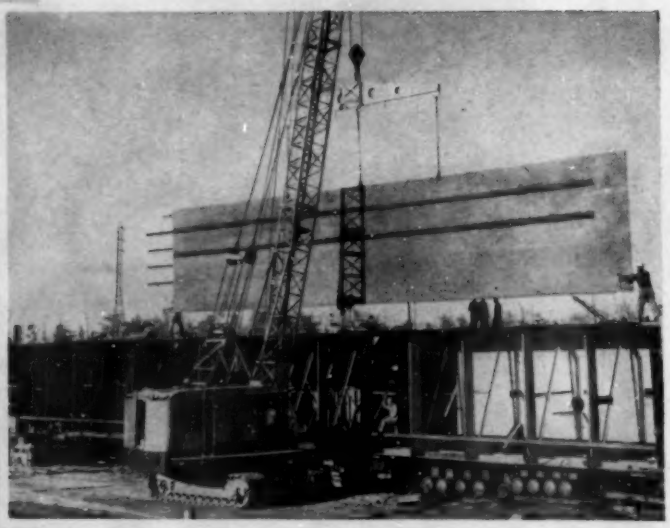
Talk it over now with your Sinclair Representative, or write Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y.

SINCLAIR

. . . for more details circle 293 on enclosed return postal card

KOEHRING WORK CAPACITY *in action* . . .





Barge-builder — Large-section steel side-plates have to be hoisted and spotted in position for barge construction at this ship yard (above). It's an easy lift for the Koehring 605 crane. It has the power, strength and stability to safely lift up to 36 tons (on 50-foot boom). When extra reach is needed, the big 605 handles up to 110 feet of main boom — or 130-foot boom and jib.

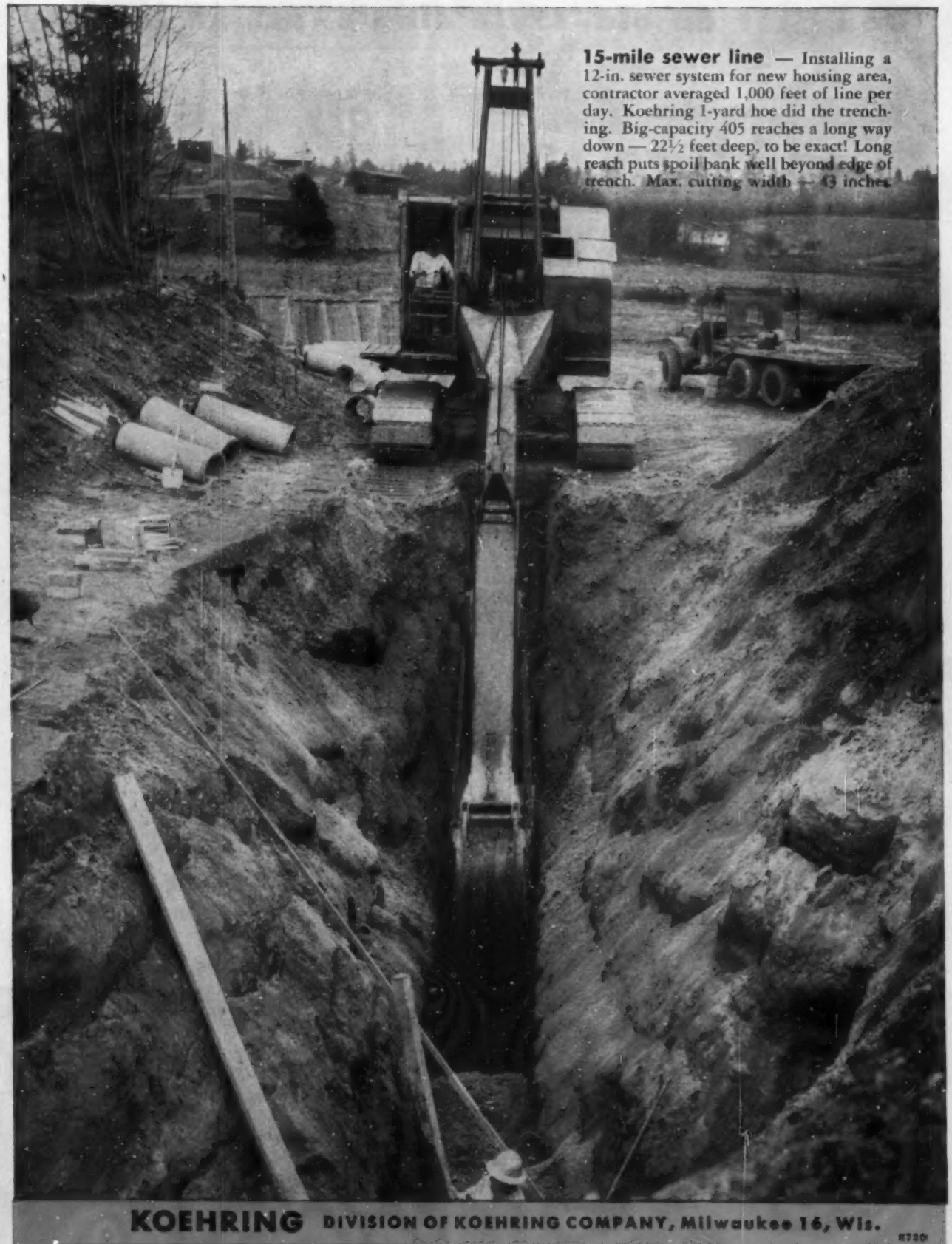
A long way up — Building reinforced concrete piers for highway bridge, men and materials are hoisted to the top by a Koehring 305 truck crane, equipped with 90-foot boom. But that's not the limit of its reach. Truck-mounted 305 raises up to 100 feet of main boom, or 130-foot boom and jib with low A-frame! Butt-connected boom is safe, solid. Inserts are easily changed, only 2 bolts per corner. Check its lift capacities in chart.

Here are some figures that will interest you:

KOEHRING MODEL	SIZE DIPPER	LIFT CAPACITIES (Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load.)	
205 CRAWLER	½-Yd.	20,000 lbs.	at 10-ft. radius
205 ON RUBBER	½-Yd.	20,000 lbs. 14,600 lbs.	at 12-ft. radius at 20-ft. radius
305 CRAWLER	¾-Yd.	30,000 lbs.	at 12-ft. radius
305 ON RUBBER	¾-Yd.	50,000 lbs. 15,800 lbs.	at 10-ft. radius at 30-ft. radius
405 CRAWLER	1-Yd.	40,000 lbs.	at 12-ft. radius
445 ON RUBBER	(Crane only)	90,000 lbs. 40,000 lbs.	at 15 ft. radius at 25-ft. radius
605 CRAWLER	1½-Yds.	72,200 lbs.	at 12-ft. radius
805 CRAWLER	2-Yds.	104,200 lbs.	at 12-ft. radius
1205 CRAWLER	3-Yds.	190,000 lbs.	at 12-ft. radius

Want more information? *See Koehring distributor*

EXCAVATORS • CRANES • DUMPTORS® • PAVERS • FINISHERS • CONSTRUCTION MIXERS • MUD-JACKS®



15-mile sewer line — Installing a 12-in. sewer system for new housing area, contractor averaged 1,000 feet of line per day. Koehring 1-yard hoe did the trenching. Big-capacity 405 reaches a long way down — 22½ feet deep, to be exact! Long reach puts spoil bank well beyond edge of trench. Max. cutting width — 43 inches.

KOEHRING DIVISION OF KOEHRING COMPANY, Milwaukee 16, Wis.

R730

. . . for more details circle 271 on enclosed return postal card

Don't let an old-style single-action loader

see how a 4-in-1 multiplies your

You've got a gun in your back two ways—with an old-style, single-action "dip-and-dump" tractor loader!

It holds you up on price, by giving you only the one machine action for your money. It hijacks your profits, by drastically limiting your job range and capacity.

Now, see what a contrast, in multiplied value and earning power, an International Drott 4-In-1 offers you!

4-machine utility... one-machine price!

An International Drott 4-In-1 gives you four built-in, multiple-duty, big-capacity machine actions, for only a one-machine price. Your fingertip command, through the "machine-selector" lever, instantly puts any 4-In-1 action you need at your service.

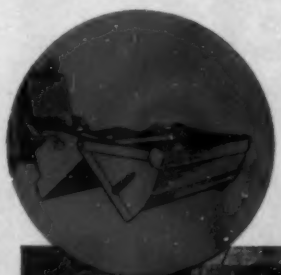
Skid-Shovel action gives you exclusive, "concrete-smashing" pry-action break-out—with famous bucket-heaping, ground-level roll-back. "Carry-type scraper" is your accurate grading, stripping, spreading, or compacting action. Clamshell action provides one-gulp "stand-and-fill" ability, plus hopper-high, self-cleanout, bottom dumping. Bulldozer action delivers aggressive, big-yardage, earth-rolling ability.

Ease into the foam-cushioned seat—prove that your 4-In-1 investment will multiply your job-taking, money-making ability. And compare the performance protection of exclusive shock-swallowing Hydro-Spring to unprotected hose-bursting, machine-mauling "lunge-and-lift" design. Ask your International Drott Distributor to demonstrate the top buy by far in the construction machinery world: the 4-In-1 size that fits your needs!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL® DROTT®

... for more details circle 314 on enclosed return postal card



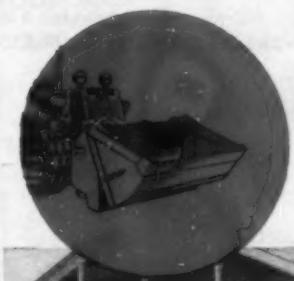
As a space-saving clam-shell, this TD-6 4-In-1 "surrounds" a pile of loose dirt—gives speedy, space-saving "stand-and-fill" action. The 4-In-1 is backfilling, grading, and landscaping on the grounds of new Canisius high school, Buffalo, New York—for Michael Wagner & Sons, Inc.

hold you up...

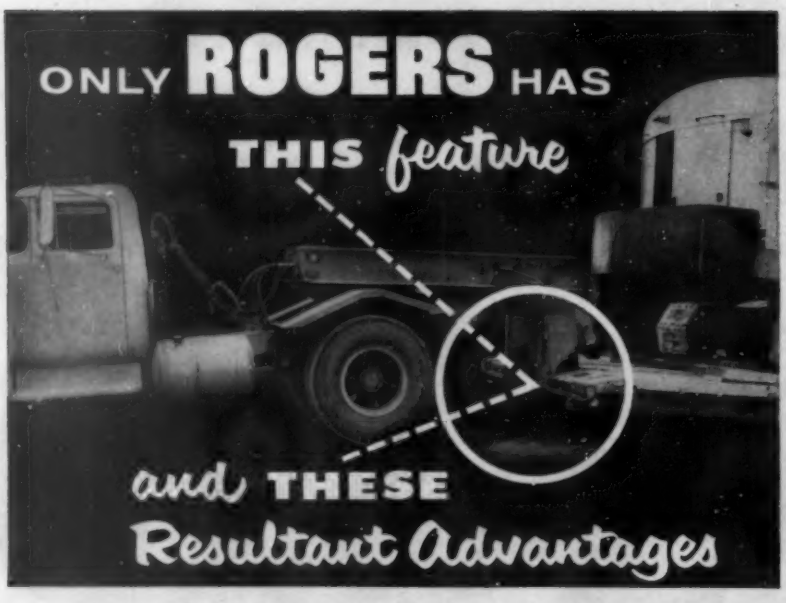
profit-range by four

Doing as much as three power shovels and a dragline, this TD-18 4-In-1 dug up, and loaded, up to 1,700 feet of old concrete pavement daily —for Henry E. Berghuis, Prinsberg, Minnesota. Famous International Drott pry-over-shoe break-out action makes the big difference over other rigs!

Earth-rolling 4-In-1 bulldozing action saves Lotz Excavating Service, Chicago, Illinois, the time and expense of putting a blade-equipped unit on the job! See how their TD-14 4-In-1 strips heavy, hard-frozen sod from a homesite—to dig a 150 cu yd basement, in only 2¼ hours (average).



"Carry-type scraper" grading with inch-close accuracy is another job-getting 4-In-1 specialty that single-action rigs can't possibly do. This TD-9 4-In-1 is making big savings by putting new home landscaping on a "production-line" basis. You can also strip and spread with this easy-to-control action!



This exclusive feature makes the Rogers HYDRAU-LIFT *more than* a detachable gooseneck trailer — one, in fact, that performs operations no other trailer can handle.

IT *detaches, loads* and *reloads* in as little as 3 minutes.

IT *loads from the front*, making turning on deck unnecessary.

IT can travel *with deck lowered or raised* to pass under or over obstructions thus avoiding detouring, moving ahead and reloading.

IT can *discharge overhanging loads* quickly and simply.

IT *raises tractor or trailer* wheels, while attached, to easily service tires or attach chains.

ITS *flat, unobstructed gooseneck* provides a convenient place on which to carry dippers, bulldozer blades, etc.

IT *requires no winch*, saving up to $900 in cost and 1000 pounds in overall weight.

PATENT NO. 2890210

EXPERIENCE builds 'em

PERFORMANCE sells 'em

PACKY SAYS:
"It's 'almost like lifting oneself by his boot straps' as the literature explains."

Send for a copy ——→

ROGERS BROTHERS CORPORATION
ORCHARD STREET • ALBION, PENNA.
Export Office, 50 Church St. • New York 7, N. Y., U. S. A.
Cable Address: BROSITES

. . . for more details circle 289 on enclosed return postal card

New Publications

A.E.D. Issues New Equipment Rented Rates for 1957

Associated Equipment Distributors, the National Trade Association of the Construction Equipment Industry, announces that its all new, 1957, ninth edition "Compilation of Rental Rates for Construction Equipment" is now available to the construction industry.

Compiled and published for the information of construction equipment users everywhere, it contains over 80 pages of national average rental rates for some two thousand items of construction machinery, and illustrates many of the major types of equipment.

Rental rates appearing in the 1957 "Green Book," as it is popularly known, were established by an A.E.D. survey conducted during May and June among the association's 700 United States distributor members.

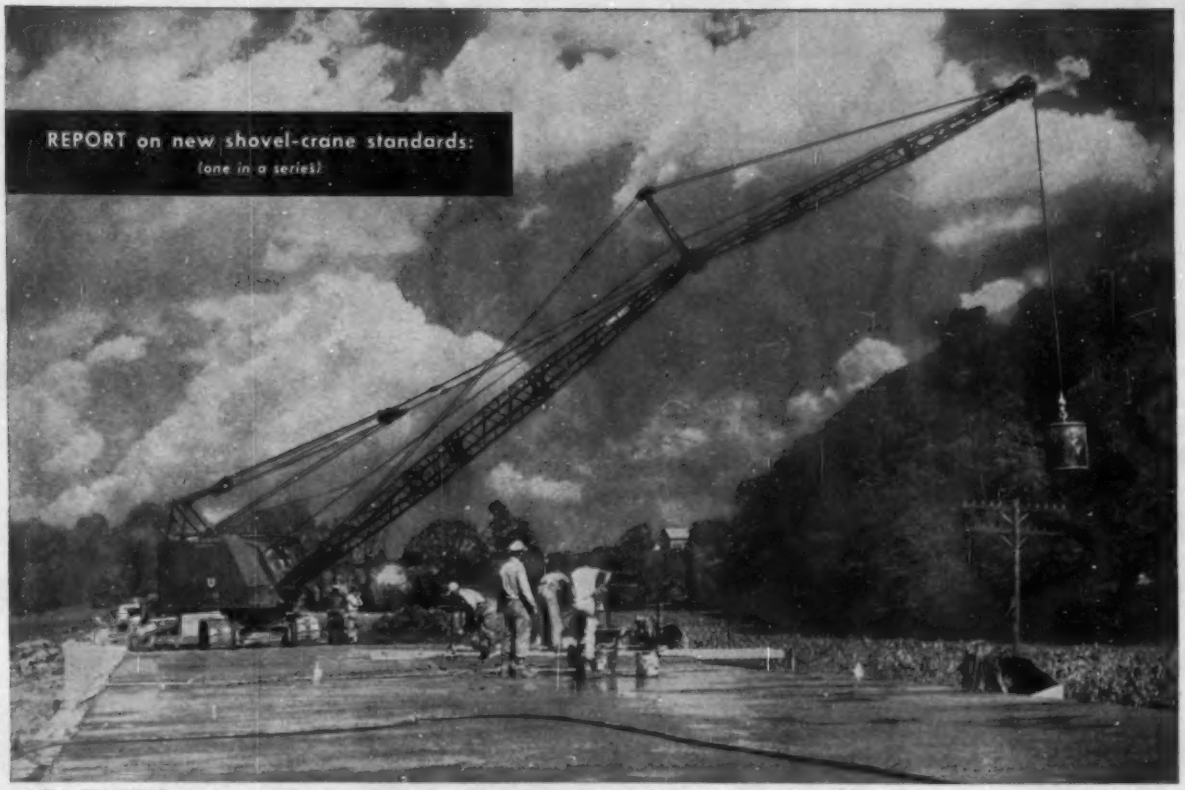
The survey and publication of the ninth edition compilation of rental rates were under the direction of A.E.D.'s rental committee, headed by D. K. Howe, Finger Lake Sales Corp., Syracuse, N. Y. Other members of the committee include: W. H. Cornelius, Harry Cornelius Co., Albuquerque, N. Mex., J. D. Davies, Rental Service Co., Philadelphia, Pa., Ralph Mulkerin, Builders' Equipment & Supply Co., West Medford, Mass., Ralph Reid, Reid-Holcomb Co., Inc., Indianapolis, Ind., G. L. Walter, Missouri-Illinois Tractor Equip. Co., Robertson, Mo., and F. J. Fitzpatrick, Parker-Danner Co., Hyde Park, Mass.

The compilation is available at $5.00 per copy from Associated Equipment Distributors, 30 East Cedar Street, Chicago 11, Ill.

"Design of Steel Structures, Including Application in Aluminum". By Edwin H. Gaylord, Jr., and Charles N. Gaylord. 545 pages. Price $8.00. McGraw-Hill Book Company, Inc., 330 West 42nd Street, New York 36, N. Y.

This student textbook, which is also for use by practicing engineers, contains the usual data needed for instruction in graduate and undergraduate courses, plus more voluminous data covering case examples of actual designs. New and original treatment of the subjects of bend-

(Continued on page 39)



NEW FEATURES—Link-Belt Speeder shovel-cranes offer many important production-increasing advantages including reversing clutches for either or both main drums, a third drum and independent rapid boom hoist for power-raising and power-controlled lowering.

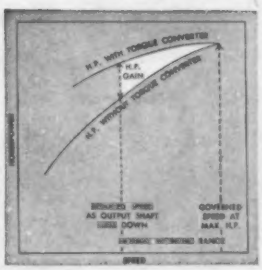
Getting bonus power...extra line pull

Size for size, Link-Belt Speeder shovel-cranes deliver greater usable horsepower than other machines using the same engines

Engine size alone is not a correct measure of a shovel-crane's actual *usable* horsepower. Thus, it's important to know Link-Belt Speeders deliver more *usable* horsepower or line pull at the drums than other machines using the same engine, yet remain well within engine manufacturers' recommended operating speeds.

Why? A Link-Belt Speeder is designed and built with extra size and strength in shafts, gears, clutches and structural members. It has the strength to fully utilize available engine power.

It's another reason why Link-Belt Speeder shovel-cranes are setting entirely new high standards of efficiency. For complete facts, contact your Link-Belt Speeder distributor or write—Link-Belt Speeder Corporation, Cedar Rapids, Iowa. 11.479-B



TORQUE CONVERTERS are available for all Link-Belt Speeder models, supply power to match the load . . . provide sustained power, increased line pull to maintain high production even with heavy loads and to handle these big loads smoothly, accurately!

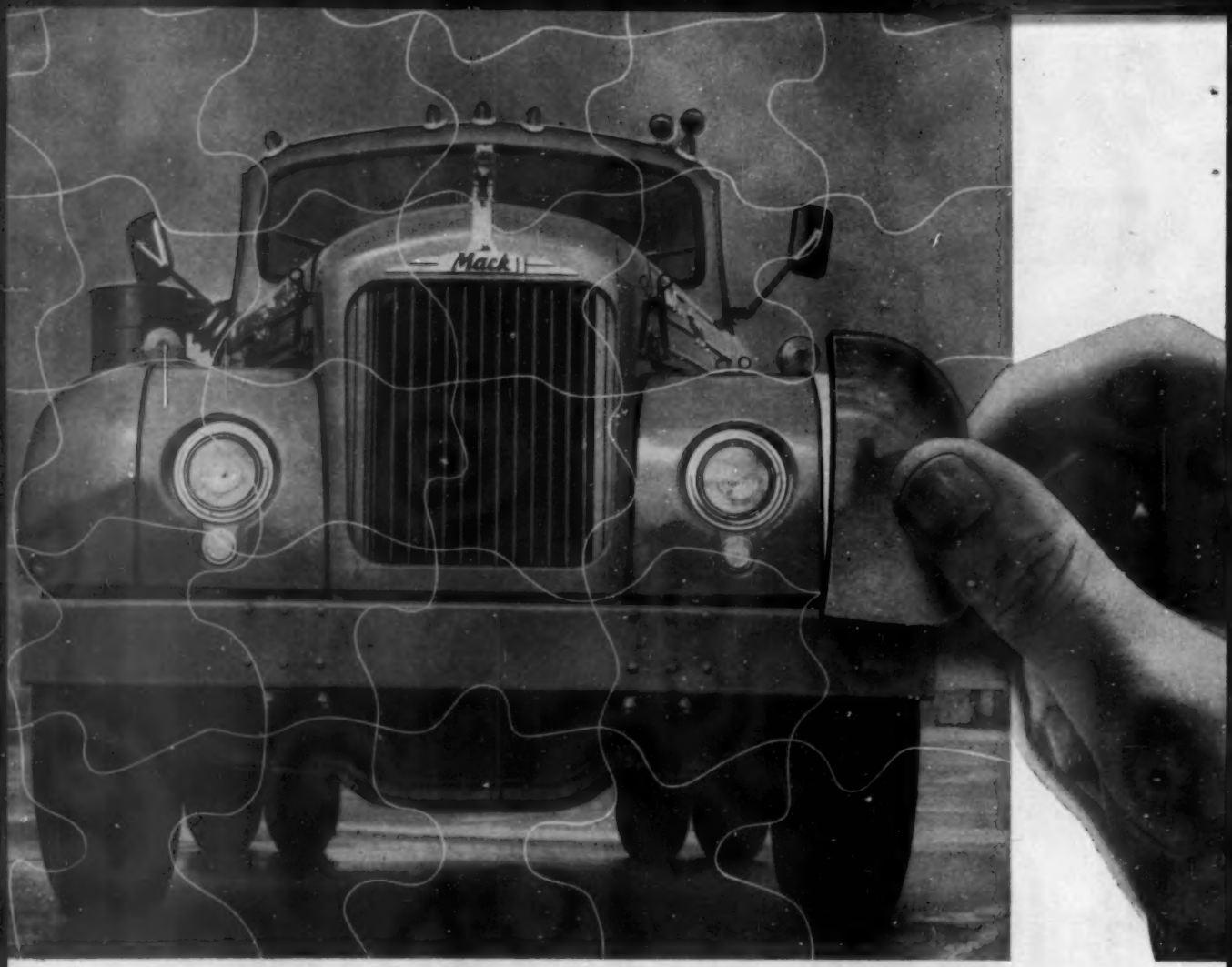
POWER HYDRAULIC CONTROLS are operated with the flick of a finger, provide fast, positive response . . . perfect feel of the load for added safety. They're standard equipment on all crawler and rubber-tired models ½ to 3-yd, 8 to 75-ton capacities.

It's time to compare . . . with

LINK-BELT SPEEDER

Builders of a complete line of shovel-cranes . . . with exclusive Speed-o-Matic power hydraulic controls

. . . for more details circle 278 on enclosed return postal card



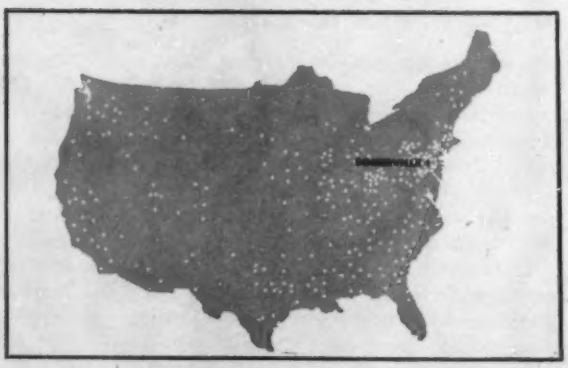
MACK parts when you need 'em

everywhere a MACK goes– there are MACK parts and MACK service

To assure you of Mack parts when you need them . . . to enable you to reduce your parts inventories . . . and to provide you with the skills of Mack service experts—Mack has established a fast-moving, transcontinental service-and-supply network.

Your Mack distributor carries a carefully balanced stock of parts. Behind him are the local Mack Factory Branches and Mack's Divisional Depots—both ready for on-call action. And at Somerville, New Jersey, there's the Mack Parts Headquarters with comprehensive stocks that include every Mack part and assembly ever likely to be needed.

For emergencies . . . almost any Mack part is immediately available through the transcontinental service-and-supply network. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.



Mack trucks can be serviced through 55 Direct Factory Branches and nearly 300 Distributors.

5072

MACK

first name for

TRUCKS

. . . for more details circle 280 on enclosed return postal card

New Publications

(Continued from page 36)

ing about both principal axes, of lateral buckling characteristics of beams, and other topics is included. Published as part of the McGraw-Hill civil engineering series, Harmer E. Davis, Consulting Engineer.

"MANUAL OF STANDARD PRACTICE FOR DETAILING CONCRETE HIGHWAY STRUCTURES" and the "Manual of Standard Practice for Detailing Reinforced Concrete Structures" have been combined under the latter title by the A.C.I. The new book is a correlation of the latest improved methods and standards for preparing drawings for the fabrication and placing of reinforced steel.

The two main sections of the new manual have been differentiated for reference purposes, grouping under "buildings" all structures which would come under the city building code and under "bridges" all structures which would come under a state highway department.

Tables, text, and drawings have been corrected to embody the revisions of the latest ACI Building Code (ACI 318-56). Incorporated into the book are 58 fold-in drawings offering the reader graphic il-

(Continued on page 46)

Meetings

AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS—Annual Meeting, Conrad Hilton Hotel, Chicago, Ill.; November 18-22.

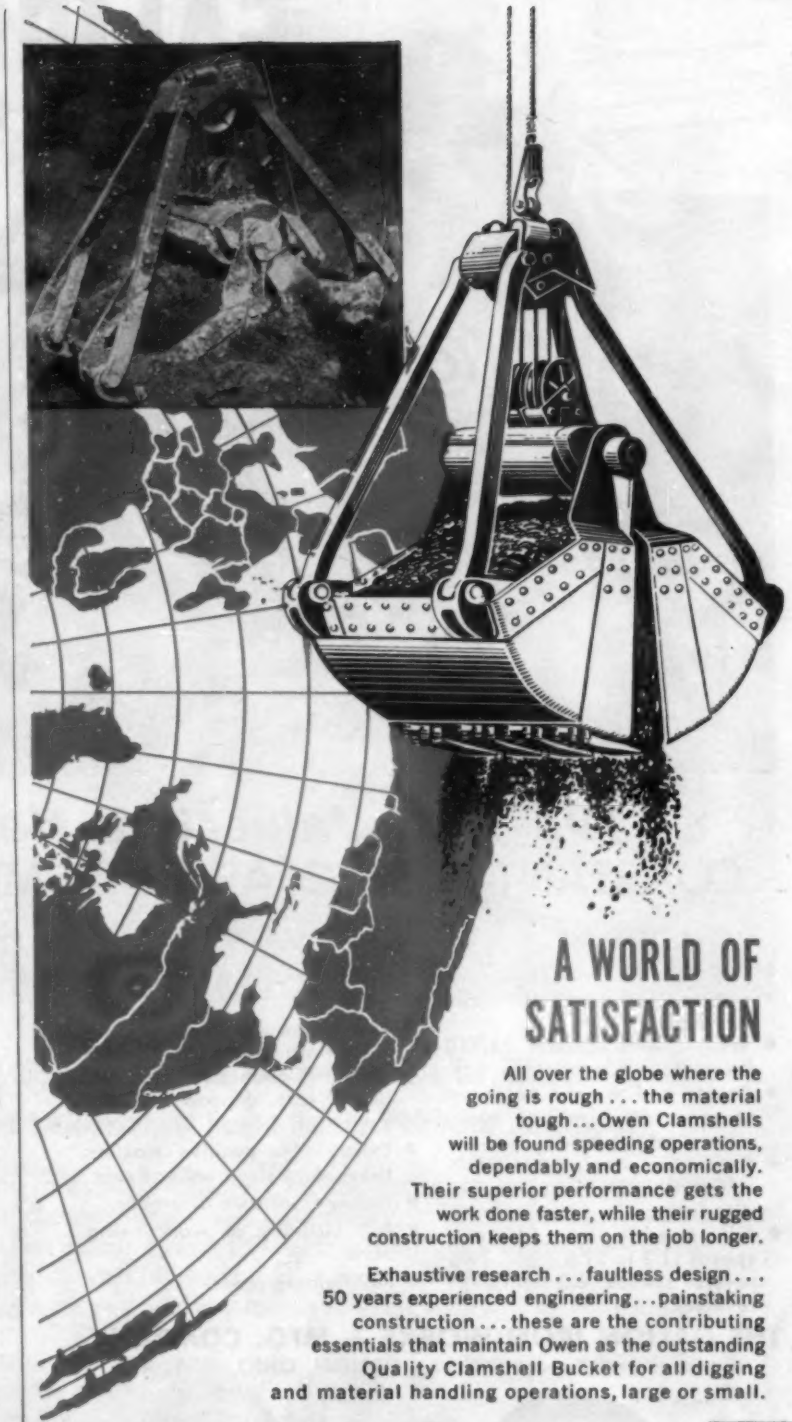
THE ASPHALT INSTITUTE—Annual Meeting, New York Athletic Club, New York, N. Y.; December 4-5.

HIGHWAY RESEARCH BOARD—Annual Meeting, Sheraton-Park Hotel, Washington, D. C.; January 6-10, 1958.

AMERICAN ROAD BUILDERS' ASSOCIATION—Annual Convention, Sheraton-Park Hotel, Washington, D.C.; January 20-23, 1958.

ASSOCIATED EQUIPMENT DISTRIBUTORS—29th Annual Meeting, Conrad Hilton Hotel, Chicago, Ill.; January 26-30, 1958.

NATIONAL BITUMINOUS CONCRETE ASSOCIATION—Annual Meeting, Hotels Sands, and Flamingo, Las Vegas, Nevada; February 3-6, 1958.



A WORLD OF SATISFACTION

All over the globe where the going is rough . . . the material tough . . . Owen Clamshells will be found speeding operations, dependably and economically. Their superior performance gets the work done faster, while their rugged construction keeps them on the job longer.

Exhaustive research . . . faultless design . . . 50 years experienced engineering . . . painstaking construction . . . these are the contributing essentials that maintain Owen as the outstanding Quality Clamshell Bucket for all digging and material handling operations, large or small.

Write today and get the convincing facts and latest catalog . . . all free upon request.

The OWEN BUCKET Co.

BREAKWATER AVENUE, CLEVELAND 2, OHIO

BRANCHES: New York • Philadelphia • Chicago
Berkeley, Calif. • Fort Lauderdale, Fla.

. . . for more details circle 286 on enclosed return postal card

GALION MODEL 118
MOTOR GRADER

The Best Value in a Heavy-Duty
CONSTANT-MESH GEAR TRANSMISSION GRADER

TIME-PROVED STANDARD FEATURES

- 115 hp International diesel engine (125 hp G.M. diesel available).
- Weight with scarifier 24,910 lbs.
- Power and weight balanced to provide utmost "push-power" at the blade.
- Extra-large single plate MOR-LIFE clutch with "Cerametallic" disc facing.
- Six overlapping forward speeds (1.3 to 22.6 mph). Two reverse speeds (8.5 mph high reverse).
- Hand steering with hydraulic booster.
- Full hydraulic operation by finger-tip hydraulic control system—Galion designed and built — safe, dependable, efficient.
- Extra-large positive-traction tires—same size front and rear.
- Heavy front axle assembly.
- Full visibility of work being done.
- Full-floating axles.

THE GALION IRON WORKS & MFG. COMPANY
General and Export Offices – GALION, OHIO, U. S. A.

A COMPLETE LINE OF MOTOR GRADERS

GRADE-O-MATIC Models

Model T-700, 190 hp, 40,125 lbs.
Model T-600, 140 hp, 30,420 lbs.
Model T-500, 125 hp, 25,765 lbs.

Gear-Shift Models

Model 118, 115 hp, 24,910 lbs.
Model 104, 100 hp, 23,635 lbs.
Model 450, 75 hp, 22,415 lbs.
Model 303, 60 hp, 16,165 lbs.
Model 503, 50 hp, 9,360 lbs.

All weights with scarifier.

Write for literature on Model 118 Motor Grader and the Galion complete line.

GALION
ESTABLISHED 1907

MOTOR GRADERS · ROLLERS

TRENCH ROLLERS • PORTABLE ROLLERS • 3-WHEEL ROLLERS • TANDEM ROLLERS • MOTOR GRADERS

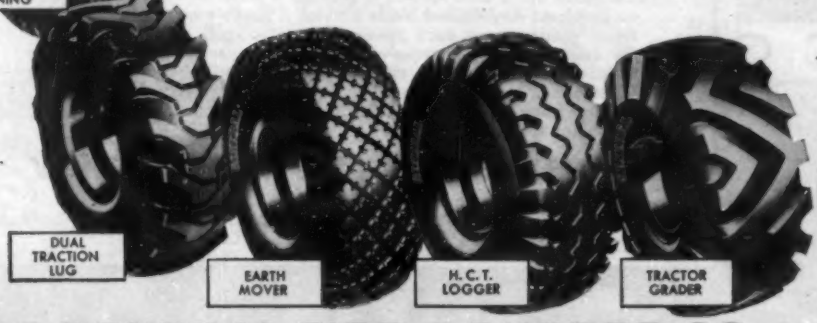
. . . for more details circle 264 on enclosed return postal card

GENERAL

NYGEN® TIRES

Moving Montana mountains in record time for Morrison-Knudsen on back-breaking Noxon Rapids Hydroelectric Project!

Daily, on construction, logging, mining and quarrying jobs from coast to coast, durable, dependable General Nygen Tires continue to amaze veteran fleet operators with their ability to cut costs and increase profits. Built tougher with Nygen Cord for the toughest jobs, General Nygen Tires can save you time and money starting today! Why not let them?



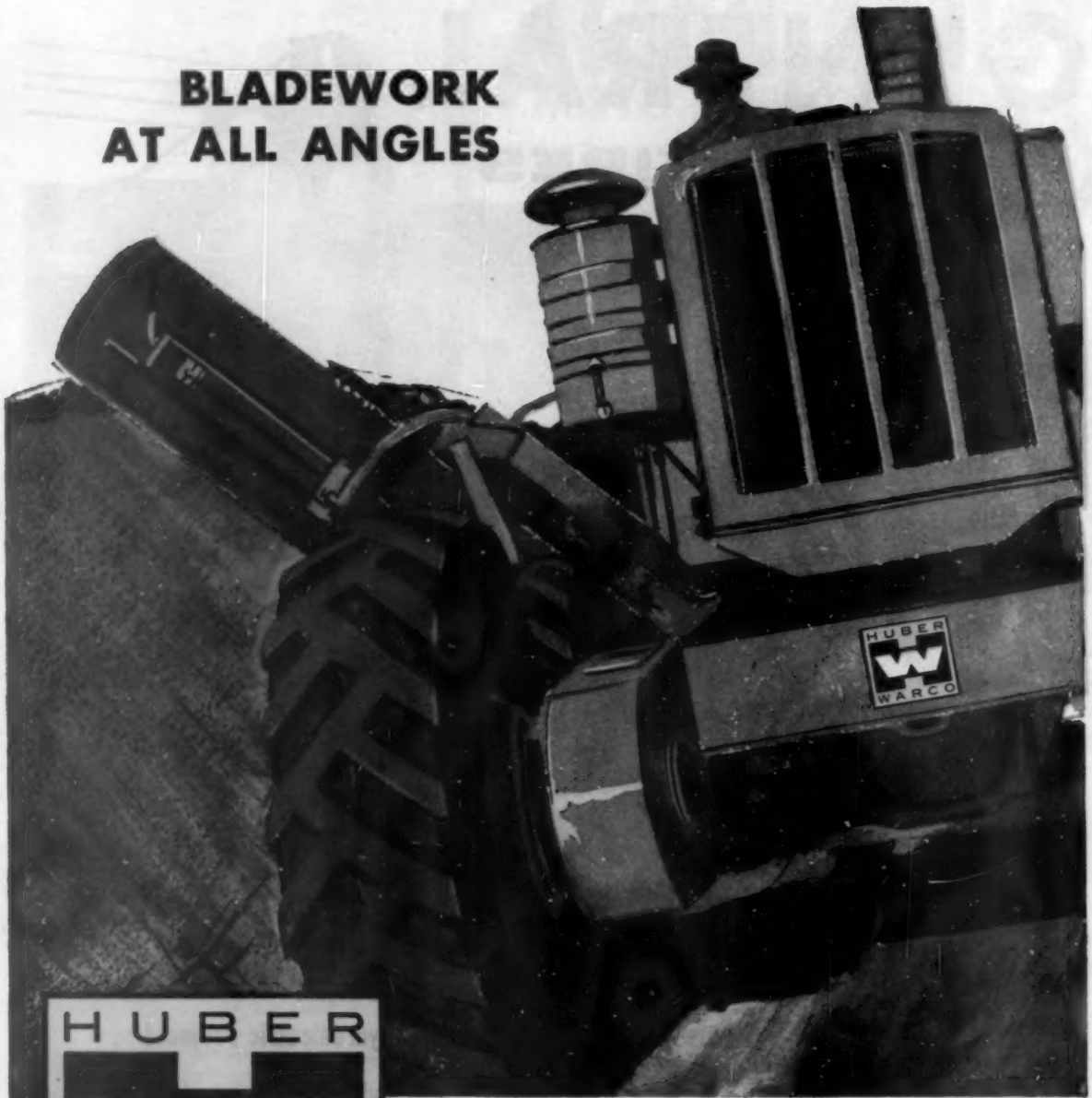
specify **GENERALS** *on new equipment*

THE GENERAL TRUCK TIRE

THE GENERAL TIRE & RUBBER CO. • Akron, Ohio

. . . for more details circle 265 on enclosed return postal card

BLADEWORK AT ALL ANGLES



HUBER
WARCO

HUBER-WARCO MOTOR GRADERS

Whether the job calls for bank-sloping, back-up pass or just moving the blade out a little farther to pick up a windrow . . . there's no problem. Any desired blade position is possible on the Huber-Warco motor graders, and each position is hydraulically controlled from the cab through the exclusive saddle design and power-sliding moldboard. There are no manual adjustments to be made. There are 10 standard transmission and torque converter models available ranging from 75 to 195 h.p. See your nearest Huber-Warco distributor for details.

HUBER-WARCO COMPANY
MARION, OHIO

HUBER WARCO

SEE YOUR NEAREST
HUBER-WARCO
DISTRIBUTOR

ALABAMA—Birmingham—Leary & Owens Machinery Co., Inc.
Birmingham—C. W. Stewart Machinery Co.
Montgomery—Leary & Owens Equipment Co.
Mobile—Leary & Owens Equipment Co.
ARIZONA—Phoenix—Equipment Sales Co.
ARKANSAS—Little Rock—Euclid-Arkansas, Inc.
CALIFORNIA—Fresno—Contractors Equip. & Supply Co.
Los Angeles—Santa Fe Equip. Co., Inc.
Redding—Paul Droscher Sales
Sacramento—Western Traction Co.
San Bernadino—Santa Fe Equip. Co., Inc.
San Francisco—Western Traction Co.
COLORADO—Denver—Paris-Moritz Equipment Co.
CONNECTICUT—Wallingford—Tyler Equipment Co.
DELAWARE—Dover—Chesapeake Supply & Equip. Co.
FLORIDA—Jacksonville—Florida Equipment Co.
Miami—Florida Equipment Co.
Orlando—Florida Equipment Co.
Tampa—Florida Equipment Co.
GEORGIA—Atlanta—Georgia Machinery & Supply Co.
Savannah—Morgan's, Inc.
IDAHO—Boise—The Sawtooth Co.
ILLINOIS—Chicago—Gil Boers Equipment Co.
INDIANA—Lawrence—Deeds Equipment Co.
Rochester—Deeds Equipment Co.
IOWA—Des Moines—Mainline Equipment Co.
Sioux City—Malloy Equipment Co.
KANSAS—Logan—Ed Graham Road Equip. Co.
KENTUCKY—Louisville—Emmett C. Watson Co., Inc.
LOUISIANA—Shreveport—Construction Machinery Corp.
MAINE—Augusta—Murray Machinery Co.
MARYLAND—Baltimore—Chesapeake Supply & Equip. Co.
Hyattsville—Chesapeake Supply & Equip. Co.
MASSACHUSETTS—E. Longmeadow & Wallingford—Tyler Equip. Corp.
Watertown—E. W. Systrom Co.
MICHIGAN—Grand Rapids—Miller Equipment Co.
Iron Mountain—Lake Shore, Inc.
Livonia—Miller Equipment Co. of Detroit
MINNESOTA—Duluth—P. H. Machinery, Inc.
Minneapolis—Ruffridge-Johnson Equip. Co., Inc.
MISSISSIPPI—Jackson—Equipment Inc.
MISSOURI—Independence—Burnup Equipment Co.
St. Louis—Cummins, McGowan & West, Inc.
MONTANA—Billings—Caird Engineering Works
Helena—Caird Engineering Works
NEW JERSEY—Three Bridges—Ross, Young, Dilts Co.
NEBRASKA—Lincoln—Highway Equipment & Supply Co.
Omaha—Fuchs-Clayton Machinery Co.
NEVADA—Reno—General Equipment Co.
NEW YORK—Buffalo—Rupp Equipment Co.
Coram, Long Island—Municipal Machinery Co.
Latham—Mott-Manbeck Machinery Co.
New York—Hodge & Hammond, Inc.
Plattsburg—F. P. McKeefe & Co.
Rochester—Rupp Equipment Co.
Syracuse—Rupp Equipment Co.
N. CAROLINA—Charlotte—Mitchell Distributing Co., Inc.
Raleigh—Mitchell Distributing Co., Inc.
Spruce Pine—Mitchell Distributing Co., Inc.
N. DAKOTA—Fargo—Swanston Equipment Co.
OHIO—Cadiz—W. W. Williams Co.
Cincinnati—W. W. Williams Co.
Cleveland—W. W. Williams Co.
Columbus—W. W. Williams Co.
Maumee—W. W. Williams Co.
OKLAHOMA—Oklahoma City—Herd Equipment Co.
Tulsa—Herd Equipment Co.
Woodward—Herd Equipment Co.
OREGON—Portland—Nelson Equipment Co.
PENNSYLVANIA—Corry—Corry Bridge & Supply Co.
Devon—Road Machinery, Inc.
Hazleton—W. N. Dippel, Inc.
Mechanicsburg—American Equip. Corp.
Pittsburgh—Brinker Supply Co.
S. CAROLINA—Columbia & Greenville—Ray Long Equipment Co.
S. DAKOTA—Rapid City—Pecaut Equipment Co.
Sioux Falls—Pecaut Equipment Co.
TENNESSEE—Chattanooga—Story Brothers, Inc.
Knoxville—Story Brothers, Inc.
Memphis—United Road Machinery Co.
Nashville—McCarthy-Jones & Woodward
TEXAS—Abilene—Patton Equipment Co.
Beaumont—Boehck Engineering Co., Inc.
Dallas—G. A. Coffey Co.
El Paso—Construction Supplies Co. of El Paso Inc.
Houston—Boehck Engineering Co. Inc.
San Antonio—Dulaney Service Co.
Tyler—Hobbs Equipment Co.
UTAH—Salt Lake City—Archer Tractor & Machinery Co.
VERMONT—White River Junction—Kibby Equip. Co.
VIRGINIA—Richmond—Municipal Sales Co., Inc.
WASHINGTON—Seattle—Caldwell Machinery Co.
Spokane—Ferris Equipment Co.
W. VIRGINIA—Charleston—Equipment Distributors, Inc.
WISCONSIN—Eau Claire—Cunningham-Ortmayer Co.
Green Bay—Cunningham-Ortmayer Co.
Milwaukee—Cunningham-Ortmayer Co.

A Complete Line of Proven Road Machinery

ROAD ROLLERS • MOTOR GRADERS • MAINTAINERS

HUBER-WARCO COMPANY
MARION, OHIO, U. S. A.

... for more details circle 310 on enclosed return postal card

Contractor Job Safety

Any Safety Program is Profitable

By Morris E. De Witt, General Manager,
Porter-De Witt Construction Co., Inc., Pavilion, N. Y.

(From "Safety News Letter," National Safety Council, Chicago, Ill.)

"We have a long way to go before we have an ideal safety program. Yet we have done enough to prove to ourselves that in addition to all of the other desirable results from accident prevention, any safety program is profitable. Proper planning for safe operations result almost automatically in more efficient operation and lower cost. After a little practice, this fact becomes so astoundingly obvious that we wonder why it took so long to find it out."

IN WRITING an exposition of safety in construction, we recall the admonition: "Don't do as I do; do as I say." Such thinking was too evident in our early experience relative to accident prevention.

Our company listened to the preachment of safety from its beginning. We believe in it thoroughly. Yet it remained a rather intangible thing, something in the abstract. Some added way of stirring the imagination seemed required to give it concrete living appeal. We used bulletins and slogans on signs and pay checks to keep "Safety Pays" before the work force. Prizes for ideas and rewards for accomplishment were offered. We publicized the character and cause of accidents. Costs to us and to the insured—not paid by an insurance company—were emphasized. Even "The Life You Save May Be Your Own," the humanitarian side, lacked appeal to most workmen. Safety did not take effective hold, in spite of emloyees' meetings, campaigns put on by organizations, and other efforts to "popularize" the subject.

The big advance in making better safety records came with the realization that the efficient job was safer. When the relationship between efficient and safe operation became established, we had something to which every man—from top management to the man in the ditch—could subscribe with enthusiasm. Lower costs naturally have been an objective always. Yet, men had not grasped that accidents were job costs of consequence also. It took hold when the frequency of accidents became tied to production and the cost of the construction operation.

We must now conclude with surprise and some regret that, after all, the "profit motive' is the added way of stirring the imagination. I suppose this is so because the characteristic is firmly imbedded in those who make construction their life work. Historically, they are inoculated with a "reduce cost" complex. Otherwise they would not become constructors.

We do not say quite so much about safety as such today. We just talk about top efficiency and lowered unit costs. To secure these, we do a better job of planning the details of the whole project. The element of safety, or lack of it, is a natural in that planning. It is inherent. It has become axiomatic that the most efficient job is the safest job. It took a long time to find this out and practice it. We need more practice.

for earth-moving jobs on construction sites, choose . . .

CF&I CUTTING EDGES

Because

• They've got the stand-up-and-take-it qualities that really pay off when the going starts to get rough . . . special analysis, abrasion-and-fatigue-resistant hot-rolled steel that's scientifically fabricated and inspected for perfection.

• They're available in many lengths, widths, thicknesses, hole spacings; flat or curved sections, designed for graders, scrapers, dozers and allied equipment.

5096

CF&I CUTTING EDGES
THE COLORADO FUEL AND IRON CORPORATION

Albuquerque • Amarillo • Atlanta • Billings • Boise • Boston • Buffalo • Butte • Chicago • Denver • Detroit
El Paso • Ft. Worth • Houston • Kansas City • Lincoln (Neb.) • Los Angeles • New Orleans • New York
Oakland • Oklahoma City • Philadelphia • Phoenix • Portland • Pueblo • Salt Lake City • San Antonio
San Francisco • San Leandro • Seattle • Spokane • Wichita

. . . for more details circle 254 on enclosed return postal card

Here's why Euclid TC-12 Twin-Power Crawlers give you MORE WORK-ABILITY

With 436 hp, independent track drive and many other advanced design features, the TC-12 has set completely new standards of performance for big tractor work.

Your Euclid Dealer will be glad to provide specifications and performance data on work similar to yours.

SPEED

The TC-12 has speed—up to 7.8 mph forward or reverse—but that's not all. Pivot turns (one track forward and one reverse at the same time) plus changing of direction and range under full power without loss of momentum save considerable time during the tractor's daily operation.

POWER

Two engines with a total of 436 h.p. (413 net h.p. at drive train) make this Euclid "Twin" the world's most powerful crawler. Being more powerful, the TC-12 offers additional benefits, such as faster work and longer engine life, since the engine often operates at less than full capacity without strain. And, the reserve power permits handling the toughest tractor job.

MANEUVERABILITY

Pivot turns with the TC-12 take less space and time. Changing directions on the go with Torqmatic Drives makes maneuvering into position quicker. Split-half construction gives better traction on uneven ground.

EASY OPERATION

Clutching and shifting are eliminated with the TC-12 "Twin". There's 24-volt push-button starting and instant response to directional levers, range selector and hand throttle levers, all of which are conveniently located to allow complete freedom of the operator's right hand for control of attachments.

DESIGNED FOR EASY SERVICING

Many design features contribute to long life and easy servicing. Location of radiator behind operator reduces damage and improves cooling. Track tensioning and recoil system are automatic. All engine accessories are readily accessible from outside the engine compartment. Rollers can be removed without breaking track. Engines, Torqmatic Drives, and planetary final drives can be removed without disturbing the other components.

THEY ALL ADD UP **to just one thing—Euclids are your best investment.**

EUCLID DIVISION,
GENERAL MOTORS CORPORATION, Cleveland, 17, Ohio

... for more details circle 318 on enclosed return postal card

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

New Publications

(Continued from page 39)

lustrations of specific details of standard practices.

This 8½ x 11-in. wire spiral bound book, purposely bound to lie flat, is available now at $4.00 remitted to American Concrete Institute, P. O. Box 4754, Redford Station, Detroit 19, Mich.

"Calcium Chloride for Winter Maintenance", Manual M-1, provides the latest and best methods of using calcium chloride in the treatment of abrasives, and also contains specific data on procedures for direct aplication of calcium chloride. Single copies are available on request to the Calcium Chloride Institute, 909 Ring Bldg., Washington 6, D. C.

Recommended Practice for Winter Concreting (ACI 605-56). A reprint authorized by Committee 604 of the American Concrete Institute and published by ACI under title No. 52-60. Copies available at 50¢, each, to ACI members (75¢ to nonmembers). Address American Concrete Institute, 18263 W. McNichols Road; Detroit 19, Mich.

This technical pamphlet recommends air entrained concrete with the addition of 1 percent of calcium chloride by weight to cement for cold weather work. These additives permit a reduction in time of protection required for newly placed concrete. Use of accelerators and anti-freeze, keeping of temperature records, heating of materials, subgrade preparation, protective coverings, heated enclosures, curing and form removal are discussed for several types of concrete structures and preferred methods are indicated.

Highway Needs Studies 1957; a Symposium. 133 page, bulletin No. 158 consisting of papers presented at the 36th annual meeting of the Highway Research Board in January 1957. For copy write the board at 2101 Constitution Avenue, Washington, D.C.

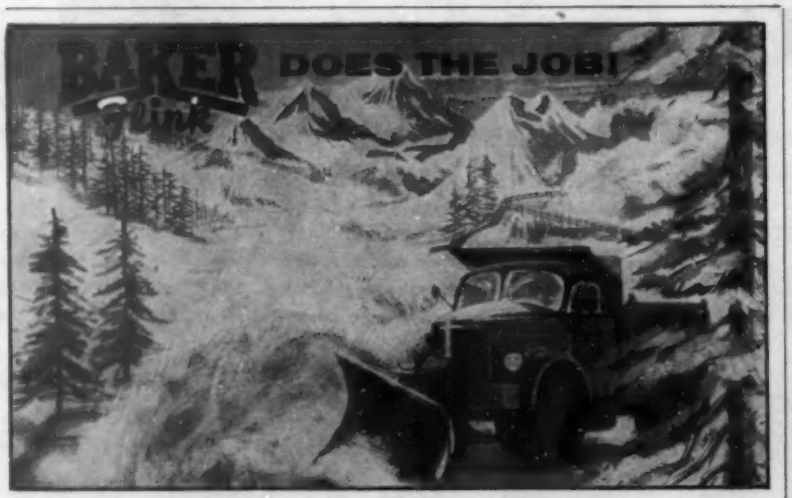
ARBA Task Force Reports (1957 Review). Studies on the highway construction industry's capacity to carry out a long range highway program. Data on planning and design, materials and supplies, construction, and machinery and equipment. Published by American Road Builders' Association World Center Building—Washington 6, D.C. Copy available on request.

Credit Problems of the Highway Industry—a Task Force Report (1957). Published by American Road Builders' Association, World Center Building, Washington 6, D. C. A copy available on request. Contains statements by industry leaders including contractors and the tabulation of practices of contractor payments in the 48 state highway departments.

Traffic speed and volume measurements. Bulletin 156, the Highway Research Board, 2101 Constitution Avenue, Washington, D. C. Three papers on this subject: (1) Measurement of urban traffic congestion, by Claude A. Rothrock and Lewis E. Keefer; (2) Moving vehicle method of estimating traffic volumes and speeds, by William J. Mortimer; (3) Speed and travel time measurement in urban areas by William P. Walker. Copy available on request to the board.

The Highway Transportation Story in Fact. Third Edition 1957. 32 pages of valuable statistics, charts

(Continued on page 51)



Reversible and one-way plows for 1½ to 5 ton trucks and up.

NEW! HWDS4 Spreader operates from the left side only! Saves material . . . gives better pattern (no material on shoulder), 2 speed auger for change from abrasives to straight rock salt.

MOUNTAIN PASS OR CITY BOULEVARD, THESE PLOWS HANDLE *ANY* JOB FASTER, AT LOWER COST!

Reversible or One-Way Plows with Sectional or Full Blade Trip permit fast, efficient cleaning over expansion joints, irregular pavement and other road hazards without damage to the blade. "Roll Action" moldboard keeps snow and slush moving from the center of the blade and off the roadway for high speed service. There's a Flink-Baker hydraulic power lift with both underframe or front push mounting to meet every specification.

FLINK "One-Man" Spreaders

Model SS Low cost, pull-type for ice, dust control and seal coating. Spreads all granular materials.

LMC Hopper Spreader handles salt, cinders and sand for heavy-duty ice control. PTO or gas-engine drive.

For illustrated literature on spreaders, plows, or name of nearest distributor write:

THE Flink co. STREATOR, ILLINOIS

5515 North Vermillion Street

. . . for more details circle 260 on enclosed return postal card

Are engineering manpower shortages delaying highway construction progress in your work area?

Eastshore Freeway, Alameda County, California

The new highway program is off to a slow start for a number of reasons. One of them is the essential time lag in translating highway programs and surveys, into detailed highway construction plans and staked right-of-way.

Here are some suggestions for modern mechanization to save manpower and speed-up engineering, as made by Robley Winfrey, Chief, Personnel and Training, Bureau of Public Roads. The list is quoted as published in the Highway Program Newsletter:

- Aerial surveying and photogrammetry as aids to location, map making, and design.
- Electronic and other types of business machines for making all types of arithmetical calculations and arrangements of data.
- The self-leveling level and other recently developed types of surveying instruments.
- Standard plans and standard portions of plans.
- Photographic processes of printing plans to save both time and expense over the time-honored blueprinting process.
- Radio communication between headquarters and field personnel, and between field-project headquarters and mobile units on surveying, construction, and maintenance.
- Longer mileage projects under one contract.
- Design tables to save calculation time.

Perhaps you can further some of these time-savers. If you have other practical ideas for speeding up the progress of the road program, write us with your suggestions. We'll be glad to give all suggestions received careful consideration and see that they are suitably compiled and summarized. They will then be submitted to the Bureau of Public Roads for possible action through their departments. They will also be published in our national advertising as of general interest to the highway industry. Address your letters to Merle Yontz, President.

1679-DC-1

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Co.

. . . for more details circle 274 on enclosed return postal card

S-12 "Eucs" prove their

Putting two sideboarded S-12's to work in a 10' wide drainage ditch at Freeport, California, A. Teichert & Son moved 400 yds. of good scraper dirt per hour on hauls of 700' to 1000'. Payloads averaged 15 yds.

Among medium size scrapers, the Model S-12 Euclid stands out as a real workhorse . . . on every kind of earthmoving job . . . in every type of scraper material! Power-packed with a 218 h.p. engine, this versatile "Euc" is cutting earthmoving costs to the bone wherever it works. Standard 24.00 x 25 tubeless tires provide plenty of traction and flotation for tough going. Hydraulic levers control scraper operations . . . eliminate downtime and expense caused by cable breakage. The S-12 can turn in only 31 ft. and carries 17 yd. heaped loads at speeds up to 21 mph. Pay-off advantages such as these are reasons why so many contractors say *Euclids are your best investment.*

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

A fleet of seven S-12 "Eucs" is moving over 400,000 yds. of clay on a 3-mile section of the Illinois Toll Road for Carl Bolander & Sons . . . they recently completed a 750,000 yd. road job in Minneapolis.

At the 600 acre Lawrence Brook Housing Development in New Brunswick, N. J., S-12 maneuverability, easy loading and fast cycle time paid off for Arnolt Bros.

worth in any scraper dirt!

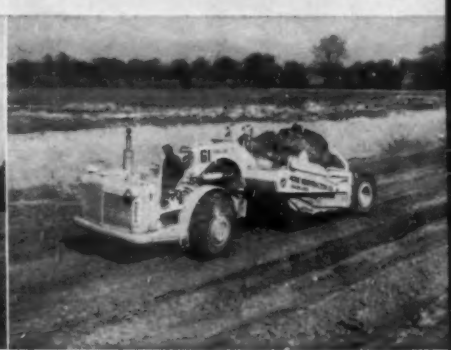
J. H. Hood & Son of Knoxville, Tenn. moved 10,000 yds. of ripped slate per week with two S-12's on 1000' hauls. Jim Hood chose the S-12 as best all-around scraper . . . likes the rigs better every day.

Worthington Construction Co. moved heavy clay and shale on the Route 22 by-pass near Allentown, Pa., with two S-12 Scrapers push-loaded by a "Euc" TC-12 Tractor.

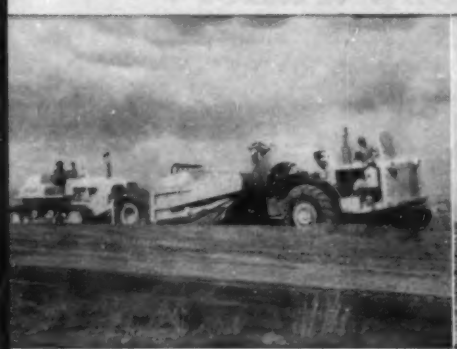
In South Miami, Florida, three S-12's maintained high production on a 400,000 yd. land improvement job for Three Boys Improvement Co.

In tripling long established earthmoving production records, Ben Ginter Const. Co., Ltd. of Vancouver maintained 93% availability with six S-12's in ripped hard pan and rock on a Trans-Canada highway job.

O. J. Hoag made the dirt fly with five S-12 "Eucs" on construction of protective barricades and access roads at Wurtsmith Air Force Base in Michigan.



Acme Construction Co. used S-12 Scrapers in their equipment spread for grading a railroad spur to an industrial site near Twinsburg, Ohio.



S-12 performance has paid off in low cost production for N. A. Degerstrom on the Spokane Freeway, Geiger Air Base and a railroad construction job at Othello, Wash.

Sloan Construction Co. of Greenville, S. C. graded the site for a Piedmont & Northern Railroad warehouse with two Euclid S-12 Scrapers.

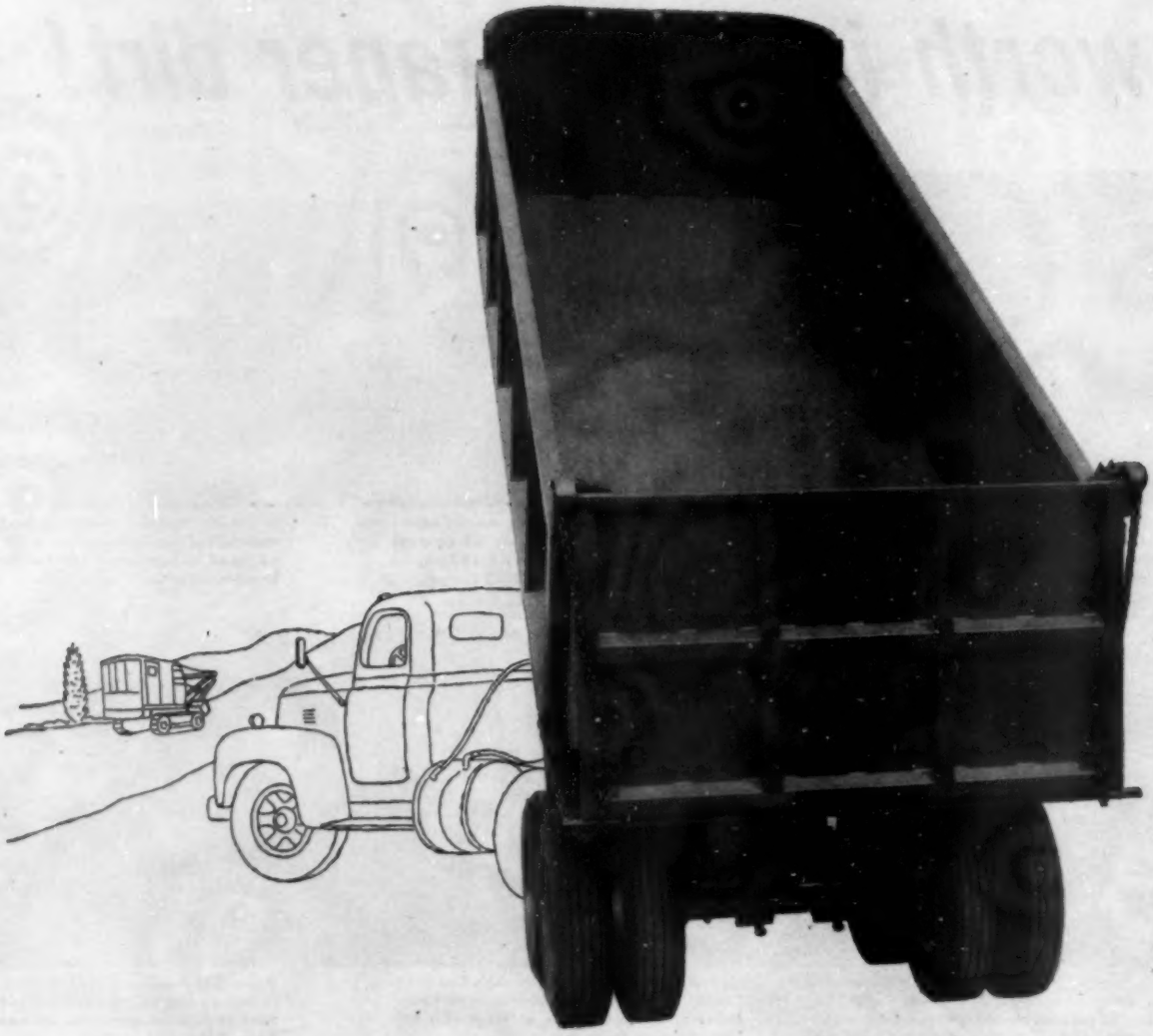
On a Florida housing site, Howard Thomas Const. Co. got 14 to 16 yd. heaped loads of sand with three S-12's. Availability of 98% has helped keep jobs ahead of schedule.

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

. . . for more details circle 317 on enclosed return postal card

. . . they recently completed a 750,000 yd. road job in Minneapolis.



Which hoist is lifting this dump trailer?

Front-Mount Telescopic | Twin Underbody Telescopic | Single Underbody Piston | Twin Underbody Piston | Frameless Telescopic

No single type of hoist can effectively meet the diverse requirements of construction work today. That's why Trailmobile provides the full range of hoist arrangements shown above and many other design variations—so that your particular dump trailer needs can be fulfilled without undesirable compromises.

Your Trailmobile representative will show you how you can "custom design" your next dump trailer for maximum efficiency under your conditions. Call him—you'll find he is an extremely helpful "consultant".

TRAILMOBILE INC.

Cincinnati 9, Ohio • Berkeley 10, Calif. • Springfield, Missouri • Longview, Texas

Sales and Service from Coast to Coast

For complete information check your nearest Trailmobile sales office or use this coupon.

TR-619

TRAILMOBILE INC. • 31st & Robertson • Cincinnati 9, Ohio

Please send me complete information on Trailmobile dump trailers.

Name_____

Company_____

Street_____

City_____ State_____

. . . for more details circle 313 on enclosed return postal card

New Publications

(Continued from page 46)

and other educational matter, available on request to National Highway Users Conference, National Press Building, Washington 4, D.C.

COMPOSITION AND PROPERTIES OF CONCRETE. By George E. Troxell and Harmer E. Davis, 343 pages, $7.75. Part of McGraw-Hill civil engineering series. A comprehensive treatise which includes chapters on such new developments as modern admixtures to promote workability and durability, latest ACI methods for proportioning concrete mixes and latest laboratory tests. McGraw-Hill Book Co., Inc., 330 West 42nd St., New York 36, N. Y.

On Construction Estimating

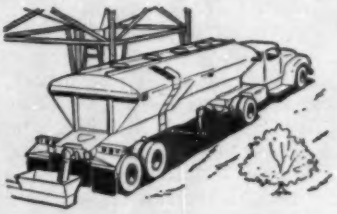
Estimating General Construction Costs, by Louis Dallavia. F. W. Dodge Corporation, 119 W. 40th St., New York 18, N. Y. Price $8.50.

This handbook presents a new method for estimating all direct production costs in earthwork, reinforced concrete work, structural steel work, masonry, and carpentry. The author devised and perfected this estimating technique during his 22 years as a specialist in estimating building and heavy construction. This fully revised and simplified second edition replaces with substantial savings the successful first edition which was published privately.

Two outstanding characteristics of the Dallavia method are said to make it of special value to contractors, architects and engineers. It is easy to employ and requires no previous knowledge of estimating. By applying an easily obtained productivity percentage against only three tables, the user can determine shift cost, output range and unit cost. Once these are discovered for each operation, simple arithmetic provides the total direct cost on any general construction job.

Second, this system does not get out-of-date because it takes into account such variables as job conditions, weather, the general economy and equipment quality. It is equally valid for any part of the U.S. (or elsewhere) since the tables allow you built-in corrections for all job conditions and all cost levels. There are over 160 tables in the work and a comprehensive five-page index insures easy reference.

There's a Trailmobile trailer for every construction need

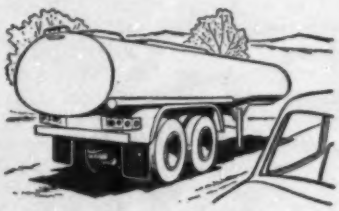


TRAILMOBILE CEMENT BULKERS

. . . transport large amounts of bulk cement to mixing plants at the job site. Both steel and aluminum types offer exclusive step-down design with twin screw discharge.

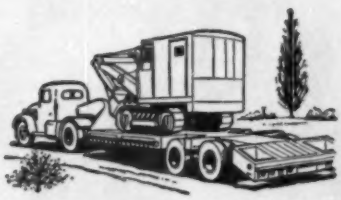
TRAILMOBILE HYDRAULIC DUMPS

. . . provide big capacity in a dump-type trailer for hauling and unloading sand and gravel. Unusually rugged construction guards against costly out-of-service time.



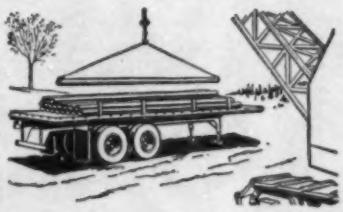
TRAILMOBILE TANK TRAILERS

. . . are widely used for hauling hot asphalt, road oils, and the great volume of water required at the site. Most units carry a unique guarantee against tank leakage.



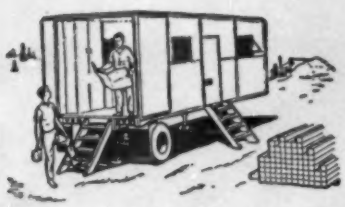
TRAILMOBILE LOW BEDS

. . . are used to deliver heavy road building equipment to the job area. Steel shovels, bull dozers and other large tractor-treaded units can be easily transported on these powerfully built trailers.



TRAILMOBILE PLATFORM TRAILERS

. . . are used for carrying lumber, cement forms, drainage tile, straw bales and sundry light equipment. "Sideless feature" permits simpler, faster loading and unloading.



TRAILMOBILE FREIGHT VANS

. . . combine weather protection and mobility for hauling general supplies. Low cost used vans provide ideal job site offices, tool shops or storage facilities.

TRAILMOBILE INC.

Cincinnati 9, Ohio, Berkeley 10, Calif., Springfield, Mo., Longview, Texas
Sales and Service from Coast to Coast

For more details circle 313 on enclosed return postal card

Report on Subsurface Investigation

Power Augers and Earth Resistivity Units as Supplements to Drilling Machines, by Donald G. Shurig. Joint Highway Research Project, Purdue University, Lafayette, Ind., January 1957. No. 1, 143 pp. Highway Research Abstracts, September 1957.

THIS THESIS pertains to the use of power augers and earth-resistivity units to supplement drilling machines for highway subsurface exploration. Basis of study was the data taken during the subsurface exploration program of the Northeastern extension of the Pennsylvania Turnpike system. Data obtained in the exploration of cut areas was selected for study for two reasons. First, only in these areas were all three machines used side by side in the same materials. Secondly, the exposed cut slopes afforded an excellent opportunity for study of the actual soil and rock conditions.

During a preliminary investigation of the complete excavations, a definition of sound rock relative to highway cut slopes was developed. With this definition and Terzahi's definition of soil for civil engineering purposes, the limits of unsound rock relative to highway cut slopes were automatically defined.

A system of classifying cut areas, or shallow conditions of the surface of the earth with which the civil engineer does considerable work, was devised. The classification system depends on the relative amounts of soil, weathered rock, unweathered rock and the structure of the exposed rock in a cut. The capabilities of and especially the accuracy of locating the "top of sound rock" by each machine, were determined for each group of cuts. An understanding of how each machine performs in various soil and rock conditions suggests how it be used in other explorations.

Before employing one of these units, the engineer in charge must anticipate the soil and rock conditions to be encountered. This he can do by means of geology maps, soils maps, photogrammetric maps and geomorphology, stereo-pairs of aerial photographs, and local field conditions and exposures.

Also considered herein is an analysis of costs of using drilling machines, power augers and electrical resistivity. From a review of the literature and from the author's field experience, considerable general information and some more specific information is presented about each machine and use thereof. Some specific information of importance to engineers includes high core losses, their causes, means of minimizing, and significance. In reference to power augers, the latest boring and sampling devices are illustrated and their use described. Modifications of presently manufactured power augers are suggested to make the auger more suitable for subsurface exploration. Means of minimizing the boulder problem when augering, as well as the advantages of the use of power augers for highway explorations over the use of electrical resistivity, are given.

● More than 680,000 sq. yd. of soil-cement pavement was placed in Michigan during 1956, including 70,000 sq. yd. for airport construction, according to the Portland Cement Association.

"Our hammer mill proved it—

Only Colmonoy No. 1 hard-facing lasts so long, costs so little!"

Colmonoy No. 1 hard-facing stands up under rough conditions involving impact and abrasion. Its cost is moderate and it welds easily. Great on equipment like dozer blades, shovel teeth, crusher rolls, and conveyor parts.

The new low-hydrogen coating provides excellent arc stability and makes weld cleaning between successive passes unnecessary. You can use it on vertical surfaces, too. Colmonoy No. 1 deposits are hard: 58 to 63 Rockwell C.

Write today for more information about Colmonoy No. 1 and the rest of the Colmonoy line of hard-facing alloys.

HARD-FACING ALLOYS

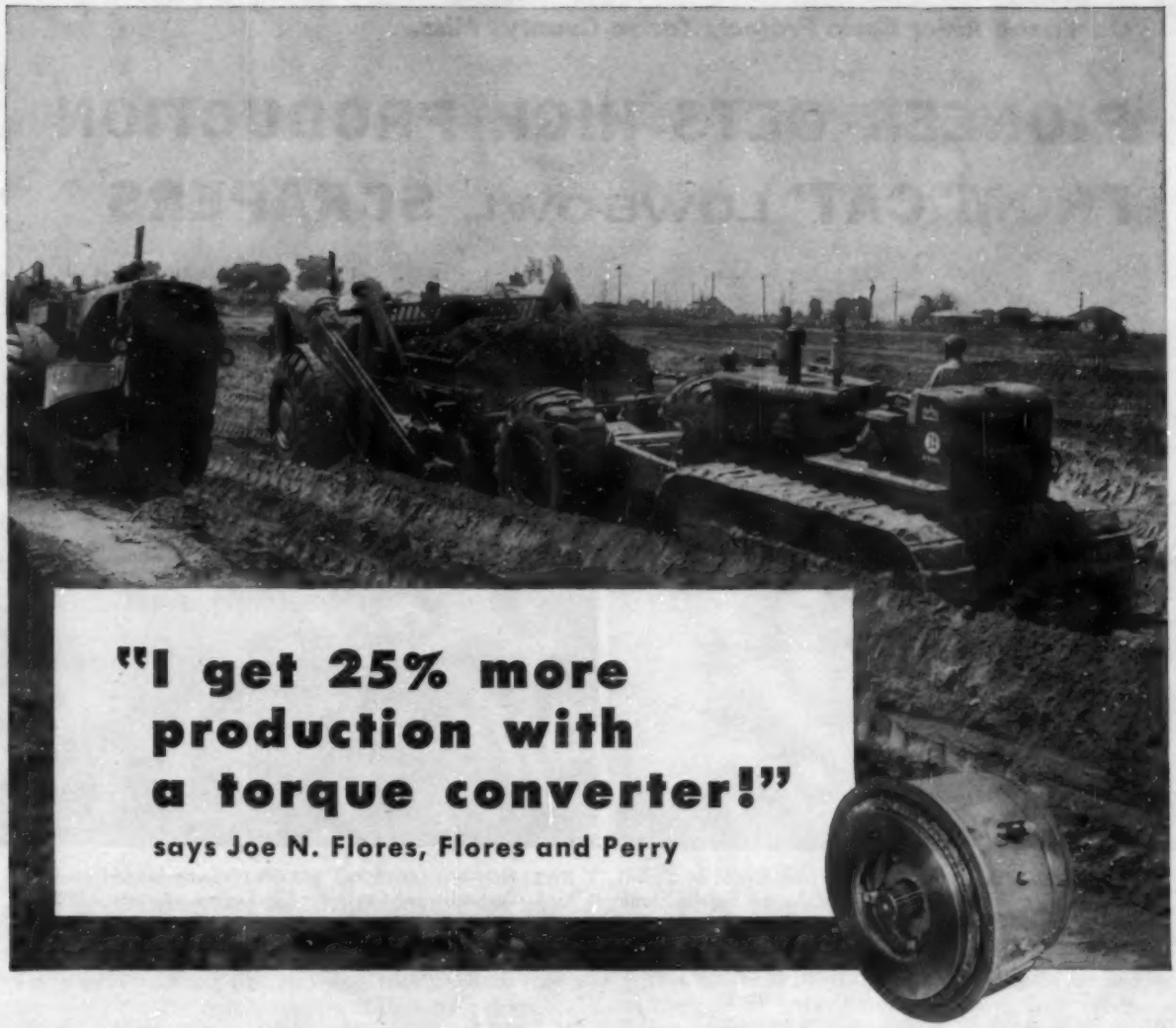
WALL COLMONOY

DETROIT 3, MICHIGAN

BIRMINGHAM • BUFFALO • CHICAGO • HOUSTON • LOS ANGELES
MORRISVILLE, PA. • NEW YORK • PITTSBURGH • MONTREAL • GREAT BRITAIN

Available as 1/8, 3/16 and 1/4-inch diameter electrodes (DC), in 10 and 50 lb. metal containers.

...for more details circle 306 on enclosed return postal card



"I get 25% more production with a torque converter!"

says Joe N. Flores, Flores and Perry

Working on an 8-mile grade-raising job on Central Valley Highway south of Hanford, California, a torque converter equipped International TD-24 is push-loading two "75" Payscrapers to the tune of 20 cu. yd. heap loads in only 42 seconds!

Production? You bet! And here's the reason for it:

"Our torque converter equipped TD-24 Tractor gives 20 to 25 per cent more production than comparable mechanical drive units!" says Joe N. Flores, of Flores and Perry, the contracting firm operating the TD-24. "That's not all, either," Mr. Flores goes on. "We estimate the torque converter drive improves service life by something like 25 per cent!"

Here's how the torque converter does it: It multiplies engine torque up to 6:1 when required. It permits the engine to deliver constant high horsepower output. It automatically matches power to load demands, with gear-shifting minimized or eliminated, for increased operator efficiency. Heavy load pick-up is smooth and even, without clutch slippage. Shock loads and vibrations are cushioned out through the converter's fluid connection, for long tractor life and minimum maintenance. An infinite variety of torque ratios is available to work with, permitting smooth, safe, accurate control of loads.

Leading tractor manufacturers today offer torque converter drives as standard or optional in various models . . . and standardize on Twin Disc torque converter components for maximum performance and proven dependability.

See your dealer now for complete information on torque converter equipped machines. Try one on your next contract and you'll agree with what leading contractors everywhere are saying: The torque converter drive is the wisest, most profitable investment you can make in a heavy-duty machine!

Twin Disc Clutch Company, Racine, Wisconsin; Hydraulic Division, Rockford, Illinois.

TWIN DISC

TWIN DISC

Torque Converters

. . . for more details circle 302 on enclosed return postal card

On Yazoo River Basin Project, Yazoo County, Miss.

PIONEER GETS HIGH PRODUCTION FROM CAT* LOWBOWL SCRAPERS

DW20-NO. 456 LOWBOWL SCRAPER is push-loaded by a giant D9 Tractor. LOWBOWL design loads more material with less resistance clear to the end of the loading cycle for quicker heaped loads.

DW21-NO. 470 LOWBOWL SCRAPER speeds heaped load on haul. Turbocharged 6-cylinder Cat Engine, also in the DW20, delivers 300 HP (maximum output)—power aplenty for working in tough conditions.

At the time these pictures were taken, Pioneer Contracting Co., Inc., Memphis, had completed 100 working days of a schedule calling for 600. The project, involving 2,045,000 cu. yd. of earthmoving on the Yazoo River Basin, covers some 7 miles of work on channels, levees, drainage ditches and road relocation. There's a fleet of Caterpillar-built units on the job, including two DW20-No. 456 LOWBOWL Scrapers, a DW21-No. 470 LOWBOWL Scraper and a giant D9. They work 24 hours a day, 5 days a week. Says Pioneer's Scraper Foreman R. C. Parker: "We prefer Caterpillar-built equipment because of ease of operation. You can also depend on them for a minimum of down time. And wherever we are, Caterpillar Dealer service is always available."

Reports from job after job show that, under identical job conditions, Cat LOWBOWL Scrapers get bigger loads faster than competitive units. Both the four-wheel DW20-No. 456 and the two-wheel DW21-No. 470 have capacities of 18 cu. yd. struck and 25 cu. yd. heaped. Their LOWBOWL design loads more material with less resistance clear to the end of the loading cycle for quicker heaped loads. And the Turbocharged 6-cylinder Caterpillar Engine delivers 300 HP (maximum output) for fast loading, hauling against adverse grades and dumping in tough going.

Whether you're a two-wheel or a four-wheel man, you can count on profitable production from LOWBOWL Scrapers. Your Caterpillar Dealer will be glad to show you competitive production facts and figures from actual jobs. Better still, name the date—he'll demonstrate on your job.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

WANTED—THE HARD WORK

. . . for more details circle 248 on enclosed return postal card

WHO SHOULD DESIGN OUR URBAN HIGHWAYS?

By Harold J. McKeever

The professional urban planners have stirred up one of the most important controversies ever faced by highway engineers and administrators. During the summer it came out into the open at a planning conference, when John T. Howard of MIT spoke out and claimed in effect that urban expressways and mass transportation systems are too important to be left to the engineer to design.

Then in September at the Hartford conference, sponsored by an insurance company, planners gave the engineers both barrels. At this affair, which drew a large gathering of highway engineers, urban planners and architects accused the highway engineers of designing billions of dollars worth of new urban expressways without enough thought to the city's master plan of transportation. What of the city of the future, they asked. Cities and their suburbs are evolving rapidly into new patterns. There is danger, it was said, that the construction of expressways "merely to suit the engineers" will freeze these patterns and make cities hideous places to live.

Since urban highways are not just physical structures, but governing factors in shaping every aspect of urban life, the planners feel that they rather than the engineers should have the upper hand.

Rebuttal from the engineers wasn't long in coming. Planners have had decades to prepare master plans, yet most large cities today do not have such plans ready. What can the planners hope to accomplish within the two-year moratorium they proposed for the road program if they have done so little in the past?

Who can say but that this challenge is the best thing that could happen at this time. It will stimulate broader thinking, force re-analysis of problems, help the engineers charged with heavy responsibility under the federal highway program to do their job better. And it may lead to more complete and effective cooperation between the various agencies who should have a hand.

The planners at Hartford largely ignored the fact that great strides have been made in planning as well as in making dirt fly on urban expressways since the War. The engineers have had to be practical, since they are charged with doing something for today's traffic muddle now. The Hartford audience also had a chance to hear Glenn Richards of Detroit tell of his city's metropolitan program, which is perhaps the best planned, researched and co-ordinated of any. In Detroit the planners and engineers sat down together, along with representatives of business and civic groups. As a result, Detroit has its new expressways in sufficient mileage to bring a dramatic improvement in arterial traffic flow. And Detroit today is doing its engineering according to an area plan that should foster sound growth.

Coming back to the controversy, the urban planning job is too big and complex for any one agency or individual to do it all. The challenge to state highway department leaders, under the job Congress has handed to them, bring together the best brains, engineering and non-engineering, to do the best possible job *now*. The engineer must have all the data to design a beam or a pavement. But he will never have all the data on which to plan for the future city. No one living knows exactly what the city of 1980 will turn out to be like.

If a planner thinks he can predict as far ahead as the life of today's new highways, just ask him, for example if he personally foresaw the steeply rising curve of population growth in our country since the World War; or the increased massing in large cities; or above all, such startling, unexpected shifts as the flow of southern negroes to the north or the fleeing of city people to suburbs—often for that reason alone—a flight which, whatever it causes, is affecting land use, complicating tax problems, and altering every planning yardstick.

Concrete Pavement Design Idea Awaits Testing

In this issue are two equally provocative discussions of the article on a proposed method of constructing prestressed concrete pavement, which was presented in August *Roads and Streets* by Edwin J. Coppage. The statement by H. Kent Preston represents the thinking of a specialist who has been a technical leader in prestressed concrete engineering. Mr. Coppage's rebuttal defending his original proposal also commands respect.

The point, as we see it, is that a proposal of this kind—i.e., to build test sections of portland cement concrete pavement using anchorages and jacking at intervals to accomplish prestressing, in lieu of high-tensile strength steel tensioning strands—is a challenge worth exploring. Until facts are obtained through controlled test construction, no one is sure "it can't be done." The economic stakes here are high.

Science has evolved by exploring new concepts, and engineers in this period of highway development have accelerated the advance of the art by showing a readiness to explore old theories and try new methods. It will be interesting to watch the fate of Mr. Coppage's bold proposal in its competition against more established methods.

Tractor-Mounted Drills the Answer on 700,000 Yard Cliff

How a towering hill is being blasted away on New Mexico's U.S. 85 Interstate relocation, while flagmen protect highway and railroad traffic below.

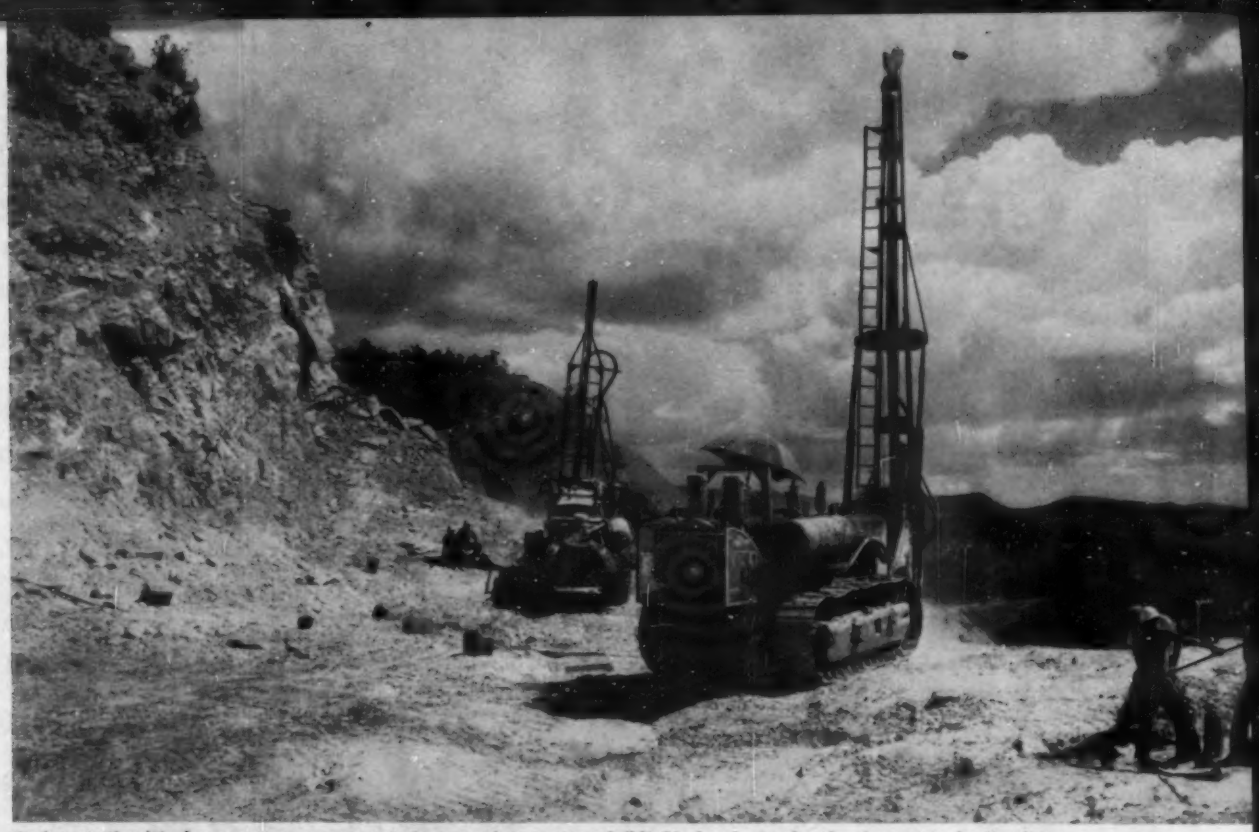
FLAGMEN are important guys on the heavy grading work in progress southeast of Santa Fe, N. M. Here in Apache Canyon, the contractor, Metropolitan Paving., of Oklahoma City, Okla., had the task of cutting back a cliff which rises 235 ft.—almost vertically in one place—above the existing U.S. 85 roadbed and paralleling the Santa Fe main line.

The contractor's two-fold problem during the past summer was to operate (and service) heavy drills stationed on a cliff-top perch and to blast and remove material without endangering the traffic below.

The highest promontory, known as Canoncito Hill, flanks a narrow defile already occupied by the railroad, the highway and a creek. In relocating the road as a modern four-lane divided Interstate highway, there was no practical alternative but to run the new line through the brow of the hill. Two closely adjacent prisms of rock excavation, required as a consequence, added up to an estimated 693,000 cu. yd. of rock removal. The larger cliff alone (the one pictured) has 440,000 cu. yd. of rock.

This work is part of project FAP-I-091-5 (9), which was awarded by the New Mexico state high-

● **First two, then three heavy drill rigs concentrated on this perch, where a few short years ago only wagon drills would have been used.**



● Joy drill with Joy compressor, mounted on an International TD-24, is shown in the foreground; Gardner-Denver drill and compressor on a Cat D8 in the background. The shelf had been taken down about 50 ft. when this picture was taken.

way department in January of 1957 to Metropolitan as a package job at $1,866,000. The excavation required, coming to 1,252,000 cu. yd. in 3.88 miles, gives New Mexico engineers and contractors a foretaste of the heavy quantities that will often characterize Interstate relocation projects in mountainous terrain.

The contractor began early in March on the big cliff, while starting other grading operations. By cutting a pioneer back-trail, the crew was able to get to the top of the sharpest promentory with a pair of scalping dozers and two tractor-mounted drill rigs. These rigs have worked the cliff-top throughout the season. One consisted of a Gardner-Denver D-99D with a Gardner-Denver 600 compressor, mounted on a Cat D8. This drill uses 3" x 20" drill steel and 3-in. tungsten carbide insert bits. The other unit is a Joy Challenger MW3 drill with a Joy 600 compressor, carried on an International TD-24 tractor. Drill steel 3" x 20" is used with 4 in. hard-rock bits. Bits are of Gardner-Denver or Ingersoll-Rand manufacture.

Beginning a series of *Roads and Streets* staff field reports on the new type of road projects which will help interconnect the nation under the 1956 Federal Aid Highway Act.

The initial operation was to doze loose boulders over the cliff to make a shelf, working under flag protection below (which will be more fully discussed). Then began a succession of 20-ft. lifts which by mid-August had accomplished about 100,000 cu. yd. of removal, all done by dozing over the shelf edge at either end. In these lifts and all succeeding ones, a 6 to 10 ft. berm of material was left at the outer edge, to minimize the fall of rocks on the traffic lanes below.*

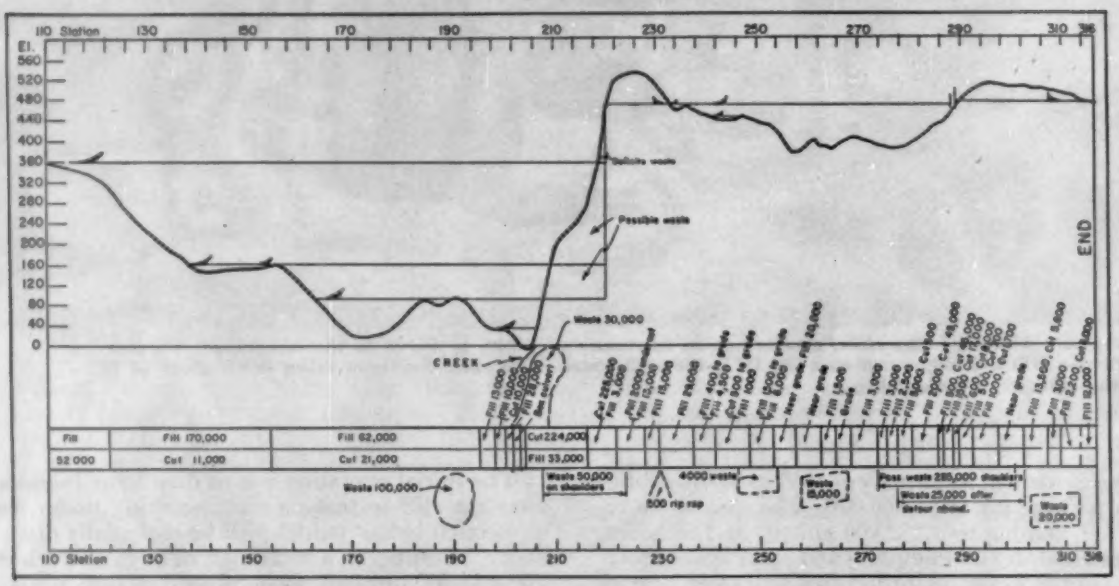
The material in the cliff consists of medium hard but very abrasive sandstone, with some shale and conglomerate and pockets of clay and sand. The design of the cut, as sketched herewith, includes a backslope angle of ½:1, with a berm located about 107 ft. down from the top. Total cut depth down to the new roadway elevation will be about 187 ft.

At the time the accompanying photos were taken (August 15), the working shelf had enlarged to about 80 x 50 ft., providing comfortable working space for the two drills but still posing some difficulty in providing retreat distance for equipment during blasting.

During the early weeks, the 3 and 4-in. drills averaged 500 to 600 ft. per drill per 8-hour shift. In June, to offset the difficulties encountered, the contractor went to two 10-hour shifts for the entire project, boosting daily blast hole production to about 1400 or 1500 ft. at the cliff location.

*An almost identical situation, with a somewhat similar procedure followed, was described for M. A. Gammino Construction Company's project on the Connecticut Turnpike. See "Berm Helps Confine Turnpike Blast Along Rail Line," *Roads and Streets*, April, 1957.

• One of two Lima 4-yd shovels with Esco rock buckets, used by Metropolitan Paving Co. on the U. S. project. Loading to D Tournarockers.



• Mass diagram developed for the New Mexico U.S. 85 project by Metropolitan Paving Company.

The abrasiveness of the sandstone is attested by the frequency of bit sharpening. The 3-in. tungsten carbide tipped bits have lasted only about 15 ft. on the average, and the 4 in. bits somewhat less.

Holes spaced about 10 x 10 ft. are loaded with Hercules "fertilizer" (Nitro Carbo Nitrate) interspersed with bagged 65% Hercomite, using a 1⅛ x 8 in. stock of Hercomite in the bottom as a primer and Primacord for detonation.

For a 20 ft. hole the usual loading is as follows: primer stick, one-half bag (6¼ lb.) of 65% dynamite, a "judgment" amount of "fertilizer," another half-bag of 65%, and finally from 2 to 6 ft. of stemming to a point near the top. The yield from shots of 50 or more holes has ranged from 1.2 to 1.6 cu. yd. (ledge yards) per lb. of explosive.

Most shots have been instantaneous, although one or two delays have occasionally been used at the back of the cut. Holes are drilled vertically except at backslopes or near the cliff edge where sometimes they are slightly slanted.

During the summer a third rig has been used on an adjoining cliff along Apache Canyon. This ma-

• One of the early blasts, this one took out the top of the cliff, and tumbled boulders down on the road below. Later shots were more carefully confined and blasts done in accordance with special flagging and other safety rules.

chine is a Joy with a LeRoi 600 compressor mounted on a rubber-tired tractor. Elsewhere the contractor is working small rock areas with wagon drills, using jackhammers for secondary shooting and inaccessible situations. Three other small or medium compressors round out an air fleet which helped move about 220,000 cu. yd. of rock largely during the period from March through July despite difficult conditions. The over-all grading job including scraper work was 45% done in this period.

Faced with a further speed-up of production, the contractors in August continued double-shift, and also brought in a Schramm Rotadrill mounted on a Schramm Pneumatractor. Delivering 11,000 lb. positive thrust on a Hawthorne 4-in. rotary bit, this unit reportedly puts down a 17-ft. length of steel without need to change bits in the sandstone rock.

The cliff removal has required careful planning. Except for the initial scalping, when boulders were rolled down on the highway, the dozing of successive lifts has been done over either end of the shelf. No rehandling was needed for the first lifts. At a point about 135 ft. down, a shelf was blasted into the west end of the hill for placing 4-yd. shovel, with expectations of dozing down to this shovel until two 4-yd. machines could take over entirely. (The shovels meantime have worked other locations.) All rock from the cliff will be hauled into a large fill area west of the hill, entailing 1.6 mile average haul.

Traffic protection has been a major problem for the contractor. While traffic handling is not a pay item, the need for extensive flagging and special precautions was impressed on the bidder. The contractor's staff includes a safety engineer who works closely with the blasting foreman and directs the flagmen.

Under Canoncito Hill one flagman is posted on the working shelf, and one spotted below at each end of the danger zone. All traffic was of course stopped during the initial scalping, until dozers stationed below could work the big block-busters to the outer shoulder. Special care has since been taken to keep the cliff slope cleared of stones which might become dislodged.

The railroad also maintained a flagman whose "All Clear" is mandatory before blasting work could be done in intervals between trains. The rock pile along the road shoulder below, plus berm 6 to 10 ft. on

Safety Rules for the New Mexico Project

(As posted on Metropolitan Paving Company's project, by Jim Ingram, safety engineer, and Robert Bledsoe, general superintendent.)

1. A yellow flag will be flown the day of blasting in the immediate blast area.
2. A red flag one hour before blasting.
3. A one-minute siren blast by both the explosives truck and the safety truck two minutes before the blast.
4. Two siren blasts will be given for an all-clear.
5. A blast sign will be in the middle of the roads leading into the area, with flagman on guard.
6. No one will enter blast area after signs are up.

● Below the cliff, the existing road is shown flanked by a berm of oversize rocks tumbled from the cliff-top by the scalping dozers. The berm helps protect the railroad on the far side and will serve as a riprap toe for the new fill.

● Goodrich's Albuquerque service agency handled the big tires.

● Bagged "fertilizer" (Nitro Carbo Nitrate) looked like this before it was poured in the 3 and 4 in. blast holes.

the outer edge of each working lift above, has served as a double baffle against rocks falling on the railroad right-of-way.

Safety rules applying to blasting have been posted where all workers could keep them constantly in mind. As shown in the accompanying memo sheet, the rules give explicit instructions involving yellow and red flags, signs and other regulations. Warning signs and flasher-equipped barricades are the most elaborate ever required for a New Mexico project. And as a special courtesy, the tourist-conscious highway deparament hands out "regret you were delayed" flyers explaining the necessity of the project.

A word about a few other features of this job. Hauling is an unusually large item, involving (for the 1,252,000 cu. yd. of unclassified, bid at $.70) a total of 3,380,000 quarter-mile-yards at $.05), 494,000 station-yards ($.01), and 365,000 ton-miles ($.065). Hauling is being done with 3 Model B 35-ton Tournarockers and 7 Euclid rear-dumps, recently increased to 12. Miscellaneous small areas have been handled by 3 Heil motor scrapers and 2 Cat DW15 and 2 Cat DW10 scraper units.

The two Lima 4-yd. shovels are equipped with abrasion-resistant Esco rock buckets and teeth. The tractor fleet for the project includes 3 Allis-Chalmers HD-21s, 7 International TD-24s, 5 Cat D8 and 3 D7s. Completing a fleet of a size previously considered normal for a job twice this length, Metropolitan has 4 dual sheepsfoot rollers, 2 50-ton rubber-tired compactors, 3 small pneumatic tractors, 4 Cat 12 graders, an Adams 660 diesel grader, and 2 Michigan 175-A loaders, not to mention 3 DW10 drawn 5,000 gal. water wagons, 1 Tournadozer, a Northwest 6 pull shovel, a Manitowoc dragline, a Lima Paymaster, a Link Belt backhoe, service rigs,

● Photo taken in September, 1957, showing how a direct 4-wheel-drive access road has been built up to the working shelf.

● A nearly completed segment of U.S. 85 relocation southeast of Santa Fe, nearing historic Glorietta Pass—an example of the high standards adhered to by the New Mexico state highway department as a means of attracting tourists and shortening the great distances.

● William A. Moody, blasting chief, and R. E. Bledsoe, general superintendent for Metropolitan Paving Co., chatting at field shop.

● Inspection tour: Don Hawk, superintendent R. E. Bledsoe, day supt. Mack Gallimore, with Lindsay F. Root of the New Mexico highway department.

● Smaller wheel-tractor-mounted Joy drill with Ingersoll-Rand 600 air supply, working at a separate location.

etc. Tires are serviced by Goodrich Tire Co., Albuquerque.

A word also about floodlights, which have been important in the double-shift operation despite the long summer hours. Single large-wattage lamps have been mounted along the highway beneath the cliff. These are powered by small individual Master generators. Most lighting has come however from floods mounted on the equipment. All hauling units are equipped with back-up lights as well.

All drainage and structure work, and a number of miscellaneous items such as fencing, cattle grades, etc., were subbed by Metropolitan Paving Co. to Reeder Construction Co., of Santa Fe. This firm set up a portable concrete batching plant which will be described in a separate article. Metropolitan planned to do part of the paving late in 1957 with asphaltic mix produced on the site in a Barber-Greene plant. This plant during the 1957 summer furnished mix for Santa Fe street work. Crushed gravel is supplied by a Pioneer 45-VE plant.

A final note of interest is the fact that a modern interchange was embodied in this fully access controlled 3.88 mile segment—a strange "new" item required to keep faith with latest interstate design standards. The interchange, complete with flanking service roads, connects with a small community beyond the canyon.

Metropolitan Paving Co., Al Kavanaugh president, is represented on the project by R. E. Bledsoe, general superintendent; Stoner McLelland, chief engineer; Mack Gallimore and Jeff Davis, day and night superintendents; Willis A. Moody, blasting superintendent; Hadley Kelsey, superintendent of safety. C. D. Rickman is project engineer for the New Mexico state highway department, spearheading an office and field effort in which many of the department personnel have cooperated under chief highway engineer L. D. Wilson.

New Mexico Leads in Interstate Projects

New Mexico state highway department personnel are proud of their out-in-front position in Interstate highway jobs. While other states have lagged, this state ranked first in the nation, according to Bureau of Public Roads mid-year statistics. It had 76.5% of available federal-aid funds for Interstate work under contract (Maryland second, with 70.5%; Wyoming third, with 63.4%).

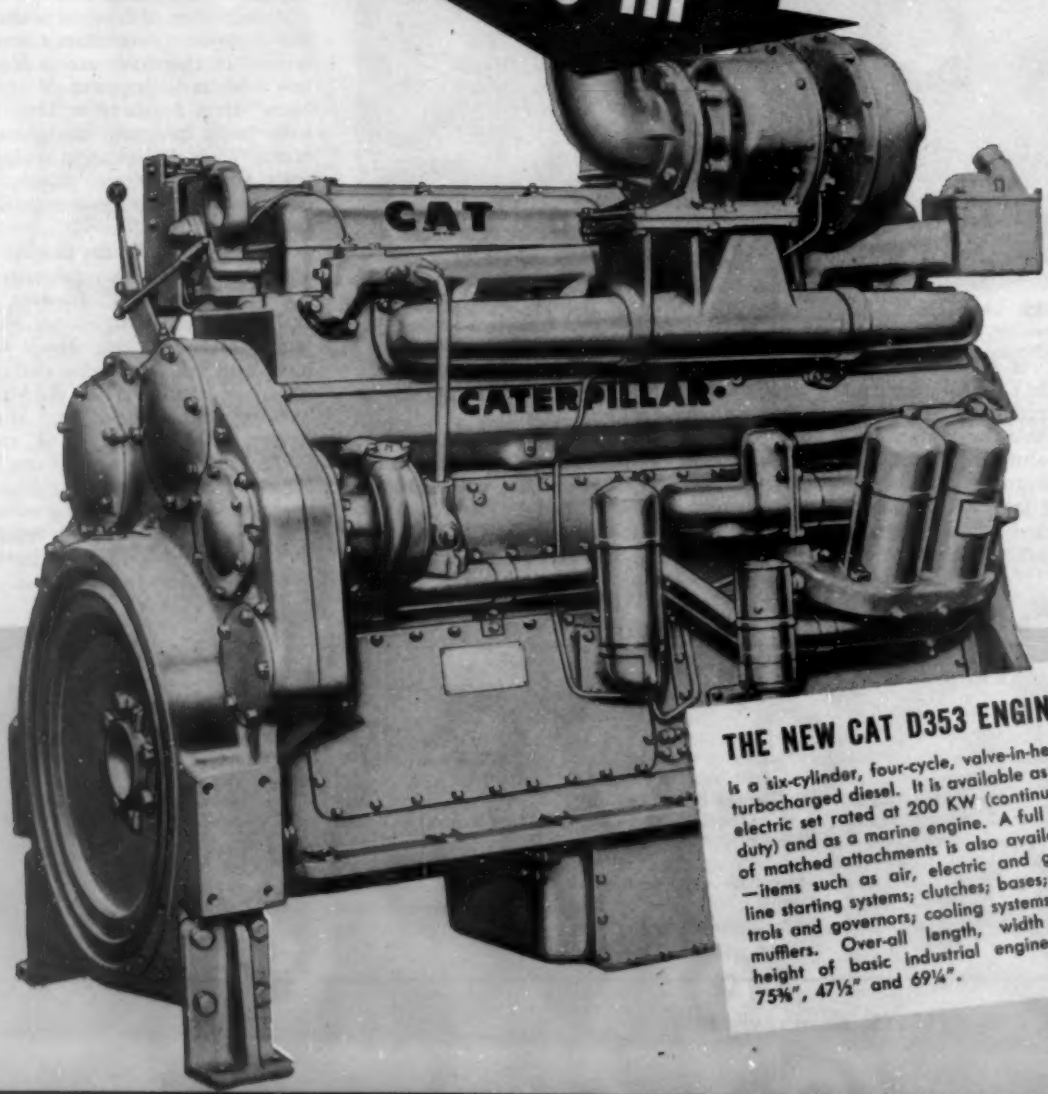
A total of 104.8 miles of Interstate jobs were under contract or already completed. This is more than 10% of the 1,008 miles of Interstate routes lying within the state. Only Texas and North Carolina exceeded New Mexico in dollar volume of Interstate contract work.

The New Mexico highway department's "secret," according to a spokesman, was no secret at all—rather its leaders were confident that Congress would pass the big road program, and made an early and aggressive start in obtaining right-of-way, arranging financing, and preparing construction plans. In the entire post-war period, the state has concentrated largely on development of main tourist routes to high standards. *Editors*

Caterpillar announces in the world's most

The engine that delivered outstanding is now available as the D353 Industrial

D397 650 HP† | D375 430 HP† | **New D353 390 HP†** | D342 225 HP† | D339 140 HP†



THE NEW CAT D353 ENGINE

is a six-cylinder, four-cycle, valve-in-head turbocharged diesel. It is available as an electric set rated at 200 KW (continuous duty) and as a marine engine. A full line of matched attachments is also available —items such as air, electric and gasoline starting systems; clutches; bases; controls and governors; cooling systems and mufflers. Over-all length, width and height of basic industrial engine are: 75⅜", 47½" and 69¼".

another heavy-duty engine advanced line of diesels

performance in the famous D9 Tractor Engine, Electric Set and Marine Engine

D337	D326	D318 (SERIES G)	D315 (SERIES G)	D318	D315	D311
310 HP†	200 HP†	175 HP†	115 HP†	137 HP†	91 HP†	65 HP†

†Maximum output capacity

Adding to Caterpillar's line of modern heavy-duty engines, there's now the Turbocharged D353 rated at 390 HP (maximum output capacity). This engine, a prototype of the unit in the mighty D9 Tractor, is job-proved after thousands of hours of operation in the field!

Like all modern CAT* Diesels, the D353 incorporates in its design the advanced features developed by Caterpillar in a quarter century of diesel leadership. Compact and sturdy, it is built for the hard work. Its four-cycle design delivers the long, effective power stroke that puts power to more efficient use than other types of engines. Its turbocharger utilizes waste energy from the engine exhaust to increase over-all efficiency and economy. Its fuel system requires no adjustment. There are no cylinder ports to clean. And its exclusive Caterpillar single-orifice injection valves, combined with the precombustion chambers, permit the use of a wide range of fuels including premium diesel fuels as well as low-cost No. 2 furnace oil *without fouling*. All these and other features add up to performance that no unit in its power class can match.

With the addition of the D353 to the Caterpillar Engine line, you now have a wider choice than ever for your requirements. Engines are available up to 650 HP (maximum output capacity) and electric sets up to 350 KW (continuous duty). Either as original or replacement power, there's one among hundreds of different arrangements that exactly meets your needs. Leading manufacturers of machinery can supply these models in the equipment they build.

For complete information about the new D353 and other Cat Diesels, see your Caterpillar Dealer. Let him show you how diesel leadership based on a quarter century of experience can engineer the modern, heavy-duty diesels of tomorrow.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Caterpillar "Firsts" In a Quarter Century of Diesel Leadership

- "Hi-Electro" hardened cylinder liners
- Chemically conditioned cylinder liners
- Stainless-steel piston protectors
- Aluminum alloy bearings
- Interchangeable, adjustment-free fuel injection equipment
- Capsule-type injection valves
- Service meters
- Superior lubricants (detergent oils)
- Notarized, certified power

AND MANY MORE!

Certified Power for Cat Diesel Engines

Through the years, Caterpillar Engines have earned a reputation for *honestly rated power*. Now Caterpillar backs this reputation with a *notarized certificate* covering the horsepower capabilities of each engine. Caterpillar is the first and only manufacturer to give you this assurance of capacity. You have a right to demand *certified power* when you invest in an engine. You get it when you buy from your Caterpillar Dealer!

. . . for more details circle 245 on enclosed return postal card

Insurance costs go down

as skyscraper goes up

The story of Liberty Mutual and the Socony-Mobil building

Building a 45-story skyscraper in Mid-Manhattan was a tough, dangerous assignment — yet the safety record on the Socony-Mobil Building was far better than all calculations. Here's why:

General Contractor Turner Construction Company and all sub-contractors were insured by one company — Liberty Mutual. This made it possible for Liberty and Turner to draw up an over-all safety plan — chart the hazards and devise ways to sidestep them — before the job began.

Liberty Mutual provided full-time, on-the-job claims and engineering supervision. Regular safety meetings were held. Every activity was checked. All injuries received immediate attention. Structural surveys and pre-blasting checks were provided by Liberty Engineers. Wherever a man turned, there was a common-sense slogan reminding him to work safely.

Thanks to complete cooperation from management and workers — Liberty's integrated safety program paid off in a noteworthy loss record — insurance savings all along the line.

10 WAYS LIBERTY MUTUAL CUTS INSURANCE COSTS ON CONSTRUCTION JOBS

1. ADVANCE ANALYSIS, by Liberty engineers, spots and controls potential hazards before each of your projects begins.

2. ENGINEERS ON THE JOB who keep your men safe, control damages due to blasting, unsafe operating methods, etc.

3. RESEARCH by specialists in Liberty's own laboratory helps solve your difficult problems.

4. AROUND-THE-CLOCK CLAIMS SERVICE — full-time claimsmen on the bigger jobs — assures fast, fair claims handling.

5. ABILITY TO FOLLOW YOUR OPERATIONS — Liberty has branch offices in 146 cities — at your service.

6. SERVICE PERSONNEL live on large projects both here and abroad, plan and guide safety operation.

7. LARGE MEDICAL STAFF, plus three rehabilitation centers, assures the best treatment for injured men.

8. SPEEDY AUDITING service, tailored to your needs, assures proper allocation of payroll classification.

9. YOU DEAL DIRECT with company sales, loss prevention, claims and medical personnel. No middlemen.

10. INSURANCE AT LOW COST. Liberty's "expense ratio" on Compensation is lower than any other mutual company. Liberty has returned $363,275,898 in dividend savings to policyholders.

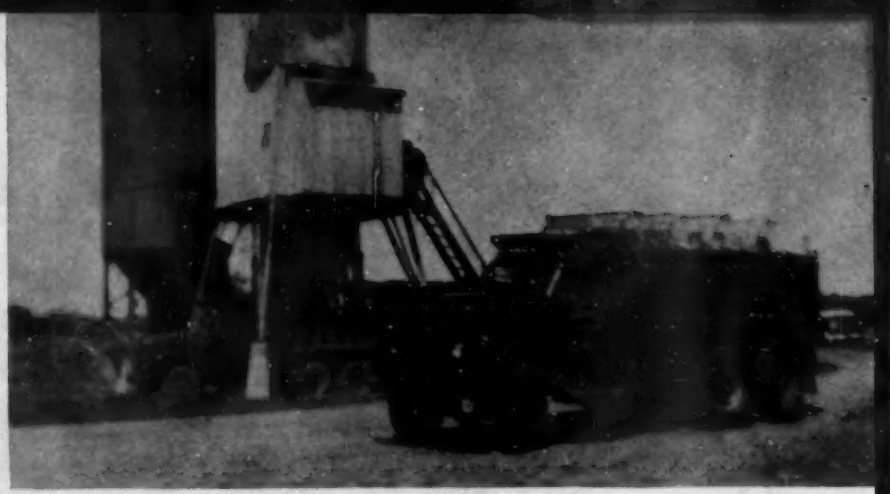
For 20 straight years — the nation's largest writer of Workmen's Compensation Insurance

LIBERTY MUTUAL

The Company that stands by you

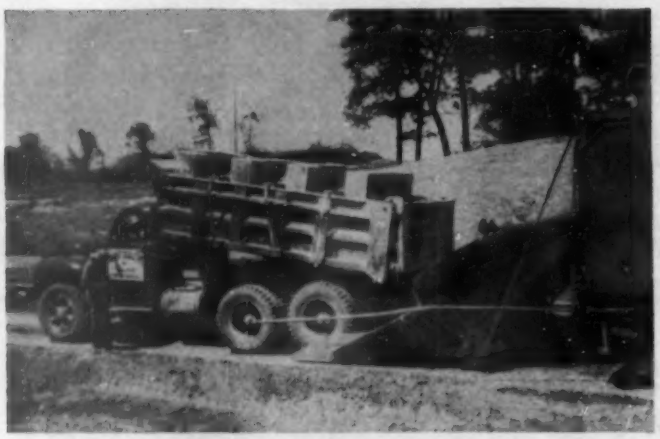
Liberty Mutual Insurance Company • Liberty Mutual Fire Insurance Company • Home Office: Boston

. . . for more details circle 277 on enclosed return postal card



● One of the S. J. Groves & Sons Co. sections batch-hauled by Union Building Trucking Co.

● Another glimpse of the firm's operations — on Suber & Ballanger's section of the Indiana Toll Road.



Unique Batch Hauling Service

How one of the contractors on the Indiana Toll Road's 1955-56 paving program served as concrete batch-hauling specialist for fellow contractors. Total batches hauled for 2,250,000 square yards of concrete for seven contract segments: 440,600—a record?

THE MOST successful contractor today usually is the one who gets the greatest number of days of productive work out of his equipment. This is a belated story of a contractor whose truck fleet was kept phenomenally busy indeed.

This bit of job history has to do with the Indiana Toll Road, which was opened to traffic late in 1956. More specifically, with one of its contractors, Union Building and Construction Corporation of Passaic, N.J., and its trucking subsidiary.

This company held complete-packaged contracts on three sections of the 156-mile project. Most of the contractors cleaned up their grading in 1954, and in the 1954-55 winter had begun to plan for the paving work ahead. At this point, Albert Scaletti, president of the trucking subsidiary of the Passaic firm, then known as Union Building Trucking Co., Inc., reasoned something like this: "Our large fleet of dump trucks working on Union Building's own toll road jobs in Indiana won't be busy at certain times. So why not consult with the other contractors along the toll road, and arrange to do part or all of their batch-hauling when it will dovetail with ours?"

Which is just what this firm did. A schedule of operations was worked out. With changes and adjustments as the jobs progressed, the work took place about as shown on the accompanying chart.

The first contractor served was S. J. Groves & Sons Co. This company's contract section 42-47, involving 375,000 sq. yd. of concrete (13.1 dual miles), occupied Scaletti's equipment in the period from May through August, 1955.

During roughly the same period, the trucks batched as part of the paving operation for Union Building and Construction Corporation's own contract section 48-50. This included 386,000 sq. yd. of concrete (13.1 miles), done by mid-September.

Meanwhile also in mid-June of that year, the truck fleet was ready for serving Western Contracting Corporation's paving section 38-41. Betwen then and mid-October, 1955, this assignment was completed to the tune of 421,000 sq. yd. of concrete along 14 miles.

Again referring to this chart, the company in the interval from September 1 to November 10 served Suber & Ballanger's contract sections 51-53. Resuming April 1, after the winter shutdown, hauling for this job was completed by June 5, 1956. Another 351,000 sq. yd. of concrete, 12.4 miles of road.

The hauling specialists also began in mid-October of 1955 on contract segments 33-37 held by Western Contracting Corp. Following the winter lay-over, this job was wound up early in June 1956. Another 408,000 sq. yd. in 13.6 miles.

This left clear sailing for a last remaining pair of jobs. One was the

. . . for more details circle 277 on enclosed return postal card

● One of the Indiana truck fleet, a Mack equipped with Heil body and four Searles cement compartments.

S. J. Groves & Sons Co. section 22-23; 241,000 sq. yd. of concrete, 8.4 miles. The other was Union Building and Construction Corporation's own second and third sections and 7-8 requiring 96,000 sq. yd. of concrete in 3.8 miles.

The grand total of jobs thus served came to 2,278,000 sq. yd. of 10-in. concrete, for 78.2 miles of 4-lane divided highway. This is believed to be a record in the hauling of batches for highway work. Moreover this figure does not include a considerable additional yardage of concrete for interchanges, curbs and ramps handled on three of the assignments. A total of 110,204 batch loads were hauled during the two seasons.

Hauling was done by the firm's own trucks. Some drivers were brought from New Jersey. Others were picked up locally and trained by riding with older drivers. The training included important little things, such as careful mirror spotting of trucks under the bins, getting the dump bodies down quickly after leaving the paver, quick turnarounds, etc. A mechanic and service truck with driver were supplied for each assignment.

The fleet included 30 Mack B-60s and 10 Autocars model C67s, mostly with Heil bodies. These were used for batch hauling. Also 2 Macks with 10-yd. and two 18-yd semis (Macks) with plywood topped bodies for cement hauling from rail siding or other mill delivery points. Autocar DC-100 diesels with dump bodies were used for stone hauling on one job.

The trucking company's arrangements varied with the different contractors. Occasionaly the firm hauled cement while the prime contractor batched or vice versa—always in the interest of making the most of an existing situation for both parties. The aim was for both parties to achieve maximum utilization of their respective equipment during the full working season.

The chief problem of the trucking firm was to watch the prime contractor's progress and keep adjusting its daily schedules to fit. Following a general rule of thumb, the firm counted on adding another truck every two days, up to estimated maximum, in order to take care of the gradual increase in haul distances as the pavers moved farther away from the patch plant.

Behind the scenes was a tough control centered at the company's headquarters in New Jersey. Each morning, Mr. Scaletti or his staff received a teletype report of trucks starting that morning out in Indiana. Each morning also came a report on the previous day's hauling, giving a log of actual truck movements on each job.

To simplify office work the daily forms sent in were so arranged that the top half of the sheet contained data which could be used for billing the prime contractors and the lower half contained data for payrolls.

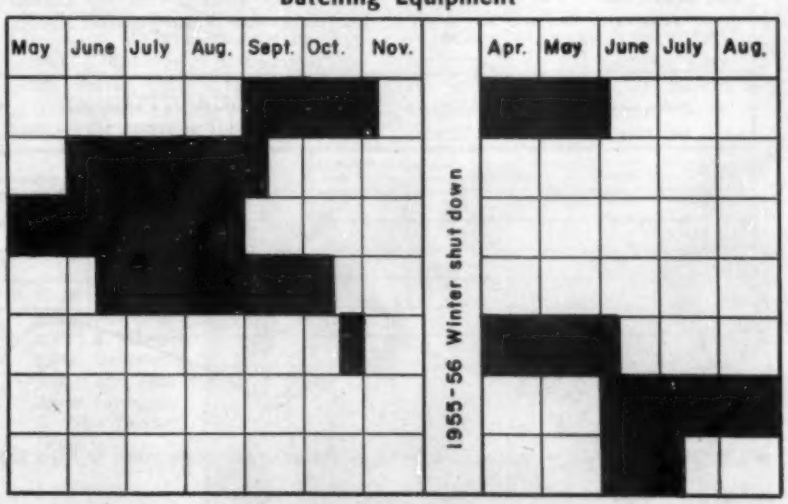
Especially of interest was the column "Reasons for Breakdown." Mr. Scaletti's purpose was to know what happened every day on every job, so that he could find out why any delay occurred and immediately take the necessary action. Also shown was the name of the mechanic serving the trucks, so that his time could be prorated in the job overhead—and be held accountable for mechanical condition.

Even such details as late-date batch deliveries and the number of returned loads were watched. This kind of really tight headquarters control was considered necessary to serve the job properly and get maximum work out of each truck.

The contractors served by Scaletti apparently also found this vigilance profitable. They were thus assured of a reliable, tightly run batching service. And they appreciated the good equipment these trucks carried; all trucks had dual axles, a bit of foresight that paid off in the light, fluffy sand prevailing along the highway.

What was par for a hauling day? The mileages varied widely due to job conditions but averaged out about as estimated. The biggest

Operating Schedule—Union Building and Contracting Corporation Batching Equipment



● Marion "semi" with Mack truck, as used to haul stone to the batch plants, as was done for some of the Indiana jobs.

● Typical of the new Autocars owned by Albert Scaletti, which today is serving firms in New Jersey along with Union road jobs.

day was on one of Western Contracting's jobs where 23 trucks hauled on a 7.5 mile average trip to the paver. A typical set-up for a single contract included as many as 18 to 23 trucks and as few as seven. The average was 14. In general, a day's run of 30 batch loads (120 batches) per truck was considered a very good one. Often the deliveries ran to only half of this. Load tallies were kept in various ways. The firm had its own 25 batch ticket, which was punched out for record-keeping purposes.

The firm's name was changed in 1955 to Albert Scaletti, Inc., with headquarters at Pompton Lakes, N.J. Recently the company has bought 30 new trucks and today it has a fleet of 75 Macks and Autocars. These are all 10-wheelers with 10-yd. water-measure dump bodies. Most have Timken tandem axles and many have Spicer transmissions. The firm is kept busy currently serving Union Building's various projects (Thruway jobs in Buffalo and east of Albany for example) and hauling for other contractors in New Jersey.

Albert Scaletti, Inc., now is one of several subsidiaries of Union Building and Construction Corp. which have evolved under the presidency of Dow H. Drukker, Jr., with Thomas C. Knowles, executive vice president. In addition to Scaletti's truck wing, there is Union Building and Equipment Co., with Don Hughes as president, which owns and assigns a pool of roadbuilding equipment. Also there is Pequanoock Sand & Gravel Co., which has one of the largest sand plants in New Jersey. A Florida subsidiary recently has completed work on the turnpike there.

This complex of companies is a phenomenon of the growing roadbuilding industry. Its vigorous management methods typify those which will be more and more in evidence as the road program grows. Mr. Drukker, for example, believes in spreading the risk through multiple job operations and decentralization of management by means of district office subsidiaries. These subsidiaries compete with each other, if necessary to make a profit. And the whole set-up goes far toward insuring maximum utilization of equipment.

Knowing full well that roadbuilding is a risky business at best, the company does everything possible to minimize business risks. It has hired top-grade engineering talent to analyze bidding opportunities and plan and estimate jobs. A company-owned mobile drill rig travels thousands of miles yearly to check on subsurface conditions before bid prices are submitted.

And finally, Mr. Drukker also believes that leadership depends on finding and developing managerial talent. The subsidiary chiefs and other key men in the group are mostly young men. Young executives are encouraged to stay and grow with the company by means of ownership participation and profit sharing.

JOB:_____ ALBERT SCALETTI, INC. FOREMAN:_____

LOCATION:_____ DAILY TRUCK REPORT DATE:_____

TRUCK	DRIVER	TYPE WORK	TRUCK TIME HRS.	DOWN	WK'G		DATE	AMOUNT		REASON BREAKDOWN	DRIVER TIME FROM	TO	HRS	RATE	AMOUNT

● One side of the daily report form used by company's headquarters to keep tight control of truck utilization.

● Pouring concrete along a driveway return in the Mobile, Ala., program. Delivering concrete to the job is a new Blaw-Knox Model 55 Trukmixer.

● Some of the heavy-duty forms which the Jackson Concrete Company has found to be profitable and assuring of an accurate job of forming to line and grade.

200,000 Foot Curb and Gutter Job

Contractor in big Mobile street program places as high as 1800 feet of curb per day, using modern steel forms and a 30-man crew.

ONE OF THE interesting aspects of the 86-mile street reconstruction job which has been in progress at Mobile, Ala., is the "whiz-bang" methods used by the contractor to build curb and gutter.

Over 61 miles of curbing has been under construction by Jackson Concrete Company of Gadsden, Ala., subcontractor for T. L. James Company, Inc., who have the general street program.

This work has involved a crew of 30 men, a labor foreman and a finisher foreman under the direction of R. N. Jackson of the contracting firm. Jackson has a definite philosophy about the best method of handling such work today. "I suppose that during our 20 years in business a man should get pretty good at a particular type of work," Jackson said. "We have learned a few things which keep us competitive." Basic to the operation are good steel forms, according to Jackson, who notes that without them, no contractor can compete with his firm.

By good forms Jackson means that they should be sturdy enough to take abuse such as workmen inevitably give them. At the same time, they should not be so heavy as to slow up the transport of forms in a pickup rather than a big truck. Ease of setting and stripping are other features that he insists upon.

During the 1957 season, this contractor has employed 4,000 lin. ft. of 10 x 6 Blaw-Knox forms, which are being made to do for a total of around 200,000 lin. ft. of curb.

Many of these form sections are from five to ten years old and still going strong, according to Jackson. The oldest of the form lengths have been cut down into odd-length sections varying from 1 ft. up to 9 ft., to be used so that the men can have steel forms clear up to the driveway opening. This is no small matter, since there are over 1500 such openings in the program.

In Mobile, the general contractor grades the street to within 2/10 ft. of proper elevation for curbs. Jackson's own motor grader man finishes the job. The form crew, working behind a grader, sets as high as 1800 to 2000 ft. of forms in a day, when necessary, doing the work in 8 hours. After the pour, concrete sets for 24 hours before stripping, which takes approximately ⅓ of the time of setting.

Jackson's trick is to use repetitive techniques to the utmost, keeping the form crew from 300 to 400 ft. ahead of the concrete crew at all times.

● R. N. Jackson of Jackson Concrete Company, Gadsden, Ala., and his labor foreman, J. D. Young, inspecting a freshly poured section.

A tale of two road

CAT* D9 Tractor push-loads a DW21-No. 470 Scraper in heavy glacial clay. Says Jack R. Hepp, Project Manager: "The D9 really is showing its stuff in this tough clay."

CONTRACTOR: E. M. Duesenberg, Inc., Clear Lake, Iowa.

JOB: Moving 4,000,000 cu. yd. for an eight-mile section of a four-lane divided highway (Route 69) near West Des Moines. Job includes cuts to 50 feet and Iowa's first complete cloverleaf.

CATERPILLAR FLEET: Two D9s, two D8s, three D7s, one D6, five DW21s, three No. 12 Motor Graders, one DW20, three D8-No. 463 Scraper units and three D6-No. 6S Bulldozers.

MATERIAL: Heavy glacial clay, shale, wet silty clay.

PRODUCTION: 20,000 yards per 20 hours on 2,000-foot round-trip hauls.

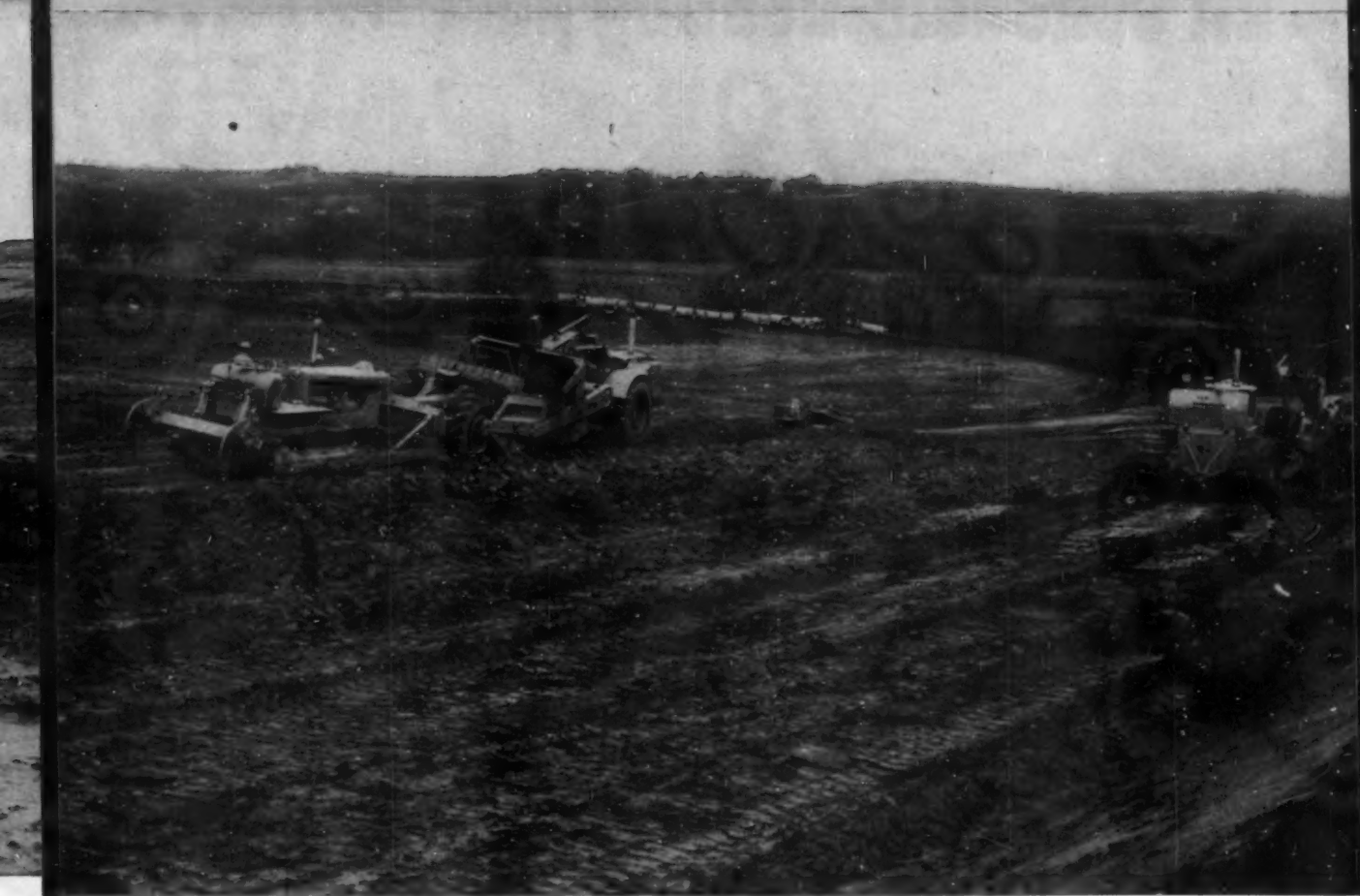
PERFORMANCE: "The D9 just can't be beat for power and for all-around performance. It really is showing its stuff in this tough clay. And this is our fourth season with some of the older DW21s. We've never had any transmission trouble or had the bowl off any of them. I feel sure our new DW21s will give us as good or better service."

JACK R. HEPP
Project Manager

AMERICA'S new highway building program presents the nation's road builders with their greatest opportunity . . . their biggest challenge. That's why you'll find contractors using Cat-built equipment wherever you find the big, tough jobs. All the way up to the giant 320 flywheel HP D9, there's a complete line of Caterpillar track-type Tractors designed to deliver more production at lower cost with less down time. Whatever your own needs may be, just call your Caterpillar Dealer for a

builders

THEY'RE WORKING ON DIFFERENT SECTIONS OF U. S. 69 (IOWA'S NORTH-SOUTH INTERSTATE HIGHWAY). THEY'RE ENCOUNTERING DIFFERENT PROBLEMS. BUT THEY'RE BOTH DEPENDING ON CATERPILLAR FLEETS TO SOLVE THEM.



D8 with No. 8 Ripper push-loads a DW21, while at right a D9 push-loads a second DW21. Says Foreman Don Washburn: "Our new D8 with its ripper is really a productive unit."

demonstration. And remember this: you can count on him to back all his equipment with efficient 24-hour service and quality Caterpillar parts.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

WANTED—THE HARD WORK

CONTRACTOR: R. B. Burch, Inc., Cedar Rapids, Iowa.

JOB: Moving 3,000,000 cu. yd. for a 10.8-mile section of Route 69, west of Indianola, Iowa. Cuts up to 50 feet.

CATERPILLAR FLEET: Two D9s, D8 with No. 8 Ripper, two D8s with sheepfoot tampers, 11 DW21s, and a No. 12 Motor Grader.

MATERIAL: Clay.

PRODUCTION: 35,000 cu. yd. per 20 hours on 3,600-foot round-trip haul.

PERFORMANCE: "Our new D8 with its ripper is really a productive unit. It loosens this hard clay, saving wear on our machines and giving us bigger loads. And our new DW21s are doing a great job. With the new LOWBOWL design, we load in the same amount of time or less and get three more yards per load."

DON WASHBURN
Foreman

. . . for more details circle 249 on enclosed return postal card

Rock-speeding Payhauler® features hit schedule-beating pace.....

ON US 27

The three-unit "65" Payhauler fleet of Greer Brothers and Young, highball 2,000 cu yd of rock 1,200 feet daily. Rock-moving climbed 'way ahead of schedule, on this U. S. 27 relocation job near Lincoln, Kentucky!

Both Payhauler sizes—the 18-ton "65", and 24-ton "95"—have built-in, schedule-beating performance!

Exclusive high reverse and "zip-around" power steering gives a Payhauler regular "pick-up truck" spotting ease. The "big-target" Payhauler body speeds the shovel's dip-and-dump cycle.

Load-matched and road-matched turbo-charged diesel power gives these heavy-duty, off-highway haulers super-fast get-aways. Next-to-automatic Payhauler control gives safe, capacity-adding speed—even over rough terrain! The "65" can roll at 36.4 mph; the "95" at 38 mph!

And the double-acting hydraulic hoist, *under full controlled power both up and down,* contributes cycle-speeding 10-to-12-second Payhauler dumping!...Extra speed on every job-phase adds up to extra profit-tons hauled!

See how a Payhauler on your job will give you a decisive, profit-margin of difference! See your International Construction Equipment Distributor for a demonstration!

Find out for yourself *all about* all the big-money-making Payhauler features. Send for your free copy of this new, fully-illustrated Payhauler catalog!

International Harvester Co.
180 N. Michigan, Chicago 1, Ill.

Gentlemen:

☐ I am a contractor. ☐ Am interested in becoming a contractor. ☐ Am an equipment operator (please check square that applies.) Send me Payhauler Catalog (CR-603-G)

Name_____

Street Address_____

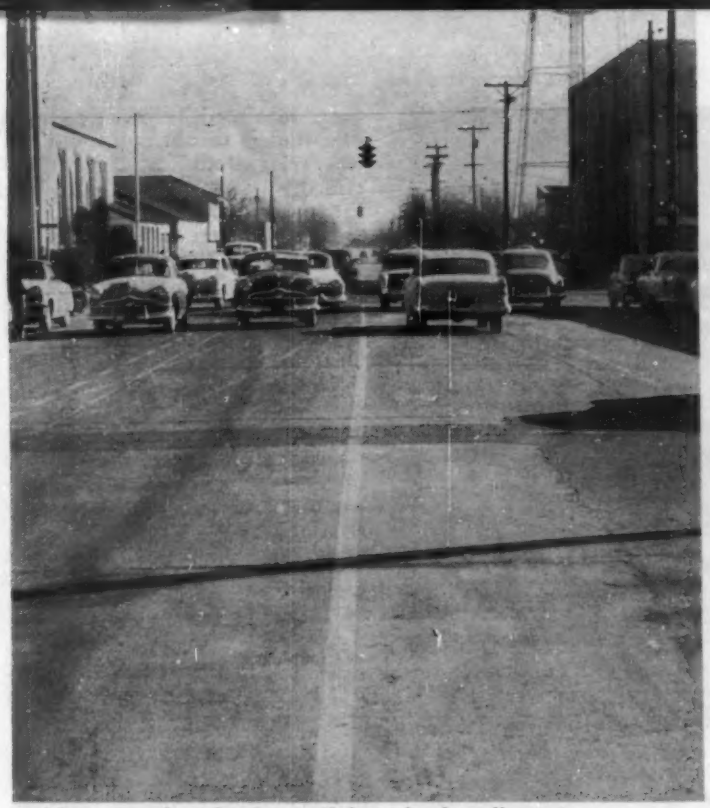
City_____ State_____

INTERNATIONAL® CONSTRUCTION EQUIPMENT

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

. . . for more details circle 315 on enclosed return postal card



More Durable Paint Stripes on Concrete Roads

● **After approximately six months' service lane lines at left and center applied over sandblasted pavement remain intact, while lane line at right applied over pavement cleaned by only broom and air-jet shows deterioration.**

A clean pavement area and adequate paint thickness are prerequisites in obtaining more enduring traffic stripes on streets and highways. These findings were made on the streets of Midland, Texas, a booming city of generally heavy traffic conditions. Stripes laid as a heavy coat of paint on pavement that had been sandblasted lasted two years before failure. It is believed these stripes could have lasted an extra two years if they had been freshened with paint before disintegration.

By Charles J. Keese and Louis J. Horn

STRIPING STREETS and highways with traffic paints calls for persistent outlay in materials and labor under present conditions of rapid deterioration on concrete.

This is distressing not only to maintenance officials accountable for expenditures, and paint manufacturers concerned with quality of their products, but also to the traffic engineers responsible for safety and convenience in street and highway travel.

The wide influence of the problem has prompted various research projects to be conducted to determine the causes of the rapid failure of paints applied to concrete pavements and possible remedies.

One researcher (Slate)[1] determined through laboratory tests that the loss of adhesion between paint films and concrete surfaces is caused by any of the following conditions: (1) vapor pressure differences on the two sides of the paint film, resulting from the resistance offered to the evaporation of water through it; (2) the formation of crystals of soluble salts under the paint film upon evaporation of water through it; and (3) superficial surface disintegration of the concrete by growing salt crystals.

The New Jersey Zinc Company,[2] in determining the best time of the year to apply traffic paint, found that excessive moisture during the first months of exposure of traffic paint lines is generally detrimental to their durability.

Other factors to be considered are the adhesive forces between the paint and the painted surface. These forces are (1) mechanical interpenetration and (2) chemical or electrical attractive forces between molecules.[1] To provide mechanical interpenetration, the paint must penetrate into the pores of the pavement. These thin fingers of paint which tend to hold the paint film to the pavement must remain sufficiently ductile to resist being broken by the upward pressures of moisture and salts acting against the film.

It seems reasonable that molecular attraction between the concrete and paint would be reduced and often destroyed by the pressure of moisture and soluble salts in contact with the under surface of the film. When superficial disintegration of the pavement surface occurs, adhesion is lost unless there has been penetration into the pavement pores at the time of painting.

In a series of tests to determine

● Close-up view of line painted six months earlier on broomed and air blown pavement shows typical loss of film by flaking caused by either surface deterioration or inadequate cleaning.

the effect of the film thickness on the life of paint stripes (Keese and Benson),[3] it was found that thicker stripes were many times more durable than thinner stripes. This was attributed to the fact that the thicker stripes remained more ductile providing greater mechanical interpenetration. It was found that the thinner paint films were very brittle and failed by flaking off of the pavement. Thicker films were more ductile and although some spots lost adhesion to the pavement, they did not flake as rapidly because of the greater tensile strength of the film.

In Midland, Texas, it was observed that pavement stripes applied to concrete pavement failed almost entirely by flaking. Careful inspection of these flakes showed that the loss of adhesion was caused by pavement surface disintegration or extremely dirty pavements.

The appearance of the material adhering to the bottom of the paint flakes gave all indications that the pavement surface had disintegrated causing the flaking.

In 1953, two paint stripes, each 300 ft. in length, were applied to concrete pavement immediately after sandblasting of the area to be covered. Another stripe was applied to an area which was cleaned in the regularly employed manner of brooming and air-jet blowing.

The two pavement stripes applied after sandblasting the pavement remained in excellent condition with practically no loss of film for two years. The stripe applied after only normal pavement cleaning was almost completely gone in a period of about six months.

The experimental sandblasting was done at a cost of 10 cents per foot by C. M. Moline, of Moline Inc., contractors, who used a 210 cfm, 110 psi compressor and regular cutting sand.

However, in theorizing for greater economy of operations it was felt that the pavement was etched more than would be required for adequate cleaning, and that by developing a bracket to control the cutting angle and height, the sandblasting could be accomplished more rapidly. It is estimated that the cost of the sandblasting could be reduced to about one cent per foot.

The paint used in this experiment at Midland, Texas, was C. H. Dragent No. 831 chlorinated rubber-alkyd combination white traffic paint. It was applied at the rate of about 22 gal. per mile.

The stripes were subject to more than normal traffic wear from an average of about 12,000 vehicles per day. Both the sandblasted and regular lines were subjected to very nearly the same traffic volume of straight moving and turning vehicles.

It is felt that if the stripes had been repainted before the paint film started to fail, an additional two years would have been obtained.

Although this experiment was only a pilot test to determine the validity of the theory that the pavement surface fails rather than the paint, the results were conclusive enough to warrant reporting to other technologists.

BIBLIOGRAPHY

1. Slate, F O. "Thermosetting Synthetic Resin Paints for Concrete Pavement Markings." Proc. Highway Research Board, Vol. 24, pp. 213-225. 1944.
2. New Jersey Zinc Co. "What Is the Best Time of Year to Apply Traffic Paint?" Paint Progress, Vol. 4, No. 2, pp. 6-7. Oct. 1943.
3. Keese, C. J. and Benson, F. J. "Experiments with Thermoplastic Striping Compounds." Highway Research Board Bulletin No. 57. 1952.

AGA Committee Forms New National Policy Group

A national policy group has been formed known as the National Joint Cooperative Committee of the Associated General Contractors and the Council of Mechanical Specialty Contracting Industries. The purpose is to study and to make recommendations on matters of mutual concern to the construction industry and the public.

In announcing this new committee, the Associated General Contractors note that the combined group includes more than 20,000 contractors performing the majority of contract construction in the United States. Along with the general contractors the committee will represent the heating, electrical, plumbing, air conditioning, piping and ventilating groups.

Topics to be taken up include the trend toward restrictive clauses in labor agreements that limit or curb industrial management's perogatives to perform construction work by contract. Also involved are ill-defined plans and specifications that lead to labor jurisdictional disputes and controversies over materials and methods, duplicated for lack of insurance coverage and other specific problems.

● Concrete pavement awards during the first eight months of 1957 totaled 66,835,000 sq. yd. of road paving, divided 51% roads, 30% streets and alleys, and 19% airport.

HERE'S ASSURANCE

that your concrete pipe will last longer!

Reinforcement with USS AMERICAN WELDED WIRE FABRIC adds strength and permanence of steel to concrete pipe. It reduces the cost of installation and maintenance. It gives you a higher-quality job.

For the Best Reinforcement be sure it is USS AMERICAN WELDED WIRE FABRIC. This reinforcement is precision-manufactured from quality cold-drawn steel wires. Its quality is rigidly controlled to assure you a fabric that meets every specification—exactly—shipment after shipment.

USS AMERICAN WELDED WIRE FABRIC is made in a complete size range to suit any type of sewer or culvert, in circumferential wire sizes up to and including ½" at 2", 3", and 4" on centers. Write or call for more information.

IN MANY WAYS, IT PAYS . . . TO ASK,

"is it Reinforced"

AMERICAN STEEL & WIRE DIVISION

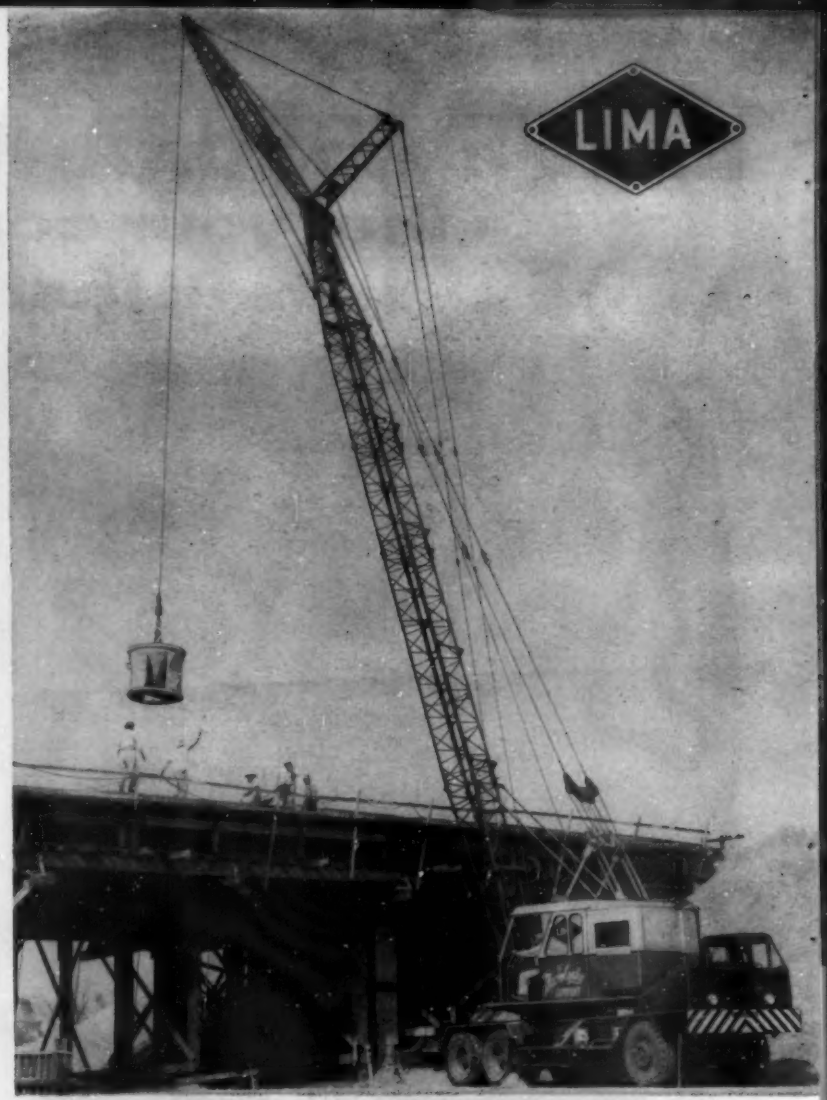
Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors
United States Steel Export Company, New York

USS

UNITED STATES STEEL

. . . for more details circle 238 on enclosed return postal card

Lima Type 54-T Truck Crane swinging one yd. concrete bucket at the end of 80-ft. boom and 35-ft. jib. At times the crane reached out more than 60 ft. to deliver material to the far side of this 54-ft. wide bridge. Job is in San Bernardino, Calif., and consists mainly of constructing 14 new bridges and widening an existing one on U. S. Highway 99 across the Santa Ana River. Work is directed by Vernon L. Leiding, Superintendent for Charles MacClosky Company, with John C. Jackson as Project Engineer.



LIMA Type 54-T is tops in truck cranes

—reports Charles MacClosky Co.

To expedite the work on its California State Highway Project, the Charles MacClosky Company, Gardena, California, found that they needed a rugged truck crane, capable of quick mobility but with real capacity. Charles C. MacClosky says: "Prior to purchasing our Type 54-T Lima 6 x 6 Truck Crane, we observed a similar Lima crane lifting heavy loads easily. Because a great amount of our work is bridge and freeway construction, we were attracted to the Type 54-T because of its stability in lifting loads with booms over 100 ft. long.

"Ever since the Type 54-T was placed in operation on our $3,500,000 San Bernardino Freeway project in San Bernardino, Calif., it has never once bogged down in the fine sand of the Santa Ana River. With a 100-ft. boom it has performed outstandingly without outriggers, assisting in the construction of the 15 bridges with no downtime and only normal maintenance.

"During our years in the construction business we have learned that any piece of equipment is finally judged by the construction men on the job. In this case, without exception, they speak of the Lima Type 54-T as tops in cranes."

Choose the exact truck crane you need from the complete Lima line. If your work requires a 15, 20, 25, 30 or 60-ton capacity crane, Lima can meet your most rigid specifications. These fast, efficient mobile cranes are available on 6 x 4, 6 x 6, 8 x 4 and 8 x 6 mountings to give you the type of drive and load distribution your job requires. Get the facts from your nearby Lima distributor. Or write to Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA SHOVELS · CRANES
DRAGLINES · PULLSHOVELS

BALDWIN BLH LIMA-HAMILTON

BALDWIN-LIMA-HAMILTON
Construction Equipment Division — LIMA WORKS

OTHER DIVISIONS: Austin-Western • Eddystone • Electronics & Instrumentation
Hamilton • Loewy-Hydropress • Madsen • Pelton • Standard Steel Works

. . . for more details circle 240 on enclosed return postal card

Roebling Royal Blue Wire Rope goes to any length to prove its **high strength!**

Every inch of every foot of Royal Blue is stronger than any rope you've ever used on *any* job. This on-the-job tenacity helps to make it the most widely and readily accepted rope in Roebling's history. It is but one of Royal Blue qualities that makes for its long service life—on any job you choose. For full details on Roebling Royal Blue Wire Rope talk to your distributor or write to Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey, for your copy of "*Wire Rope Recommendations and Catalog*."

ROEBLING

Branch Offices in Principal Cities—Subsidiary of The Colorado Fuel and Iron Corporation

. . . for more details circle 288 on enclosed return postal card

Safety Rules For Shoring Concrete

No Two Jobs Exactly Alike! This safety advice applies to bridge and grade separation projects as well as building work.

One of the most important safety rules for contractors who use sectional steel shoring to support formwork during concrete pouring operations, is to realize that no two jobs are exactly alike—each job must be laid out by a shoring sub-contractor or by someone thoroughly familiar with the capabilities of steel shoring.

If this one rule is followed religiously, shoring work of all kinds can be done with more efficiency, economy and safety.

Contractors can benefit by being fully aware of the safety precautions recommended by manufacturers of the equipment. One shoring sub-contractor and manufacturer, The Patent Scaffolding Co., Inc., makes the following suggestions of immediate concern to all users:

(1) Carefully outline *all* elements of the particular shoring job, such as:

(a) weight and size of slab or beams.

(b) type of slab—waffle, grid, pan joist, etc.

(c) height of slab or beam from the ground.

(d) whether shoring sets on previously-poured slab, fill, solid ground, rock, etc.

(e) method of pouring—concrete bucket on hoist tower, motorized buggies, chutes, etc.

(f) forming lumber required.

(2) Make exact detailed computations of *all* these elements applying to the job so as to meet the load requirements with the appropriate factor of safety. If this work is done by someone other than the shoring sub-contractor, the latter should be consulted for allowable loads and other recommendations.

(3) Make a complete layout of the job showing all engineering details and exact position of the shoring and spacing between frames.

(4) Formwork, built by the contractor, should have the following strength characteristics:

(a) extreme fiber bending—1200 psi

(b) horizontal shearing—120 psi

(c) modulus of elasticity—1,600,000 psi

(5) The construction superintendent should follow the engineering layout of the job to make sure these safety precautions are taken:

(a) verifying spacing between shoring frames and towers.

(b) correct timber and sill sizes.

(c) plywood applied at right angles to joists for maximum strength.

(d) properly compacted fill (if not on concrete floor).

(e) adjusting legs not extended over 16" of exposed screw.

(f) do not use motorized concrete equipment unless the layout states "designed for use with motorized concrete equipment".

(g) all load-bearing points are exactly as shown on the shoring layout.

(h) all slab, beam and drop head forms are tied to and supported by column and wall forms.

(i) test level of all shoring members.

In addition to these precautions, the following general safety rules should be followed when using frame-type shoring:

(1) Do not remove braces or other shoring units until proper authority is given.

(2) Never climb on cross braces. Walk only on properly placed planking.

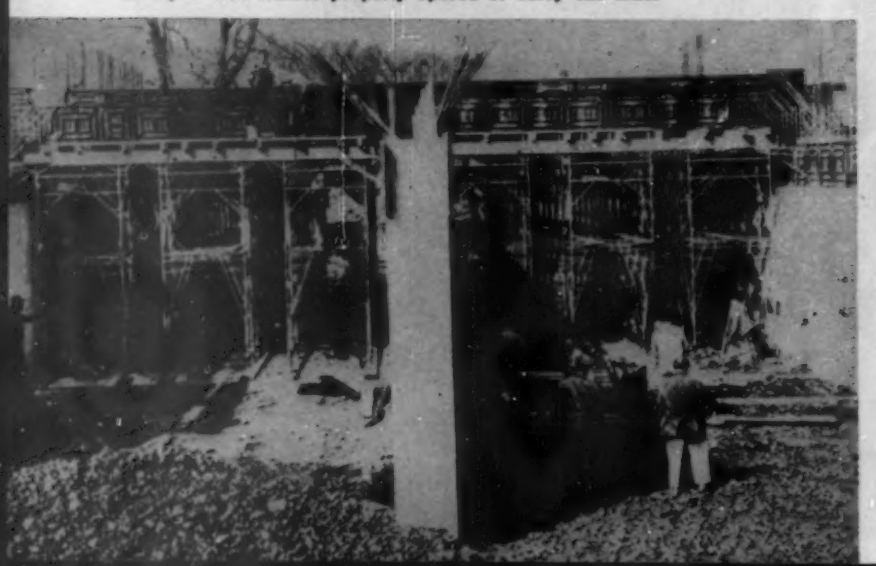
(3) Check all wing nuts or locks for tightness.

(4) Never use even slightly damaged material.

(5) When rolling shoring towers over two frames high, use hand rope guys.

If more users of concrete shoring follow these precautions and safety suggestions, advise the Patent Scaffolding engineers, they will gain the advantages of speedier jobs, reduced costs, and certainly the highest possible profits from their work.

● Pre-planning, by means of an engineered layout, will assure a neat, safe job with frames properly spaced to carry the load.



Suggest Rubber Snow Plow For Use on City Streets

The rubber blade of a new snow and slush scraper acts as its own fender and allows for close clearing round such objects as lamp standards and pillar boxes without risk of damage. The centrally supported blade is mounted to allow adjustment to any required angle to the line of travel in the horizontal plane and to move freely, within limits, in the vertical plane.

The supporting member extends to 9 in. from the ends of the blade or scraper, which is structurally strong enough to take full snow load along its entire length.

The blade can be towed or pushed with equal ease. The qualities of rubber are used; the side for slush removal is of softer rubber. The blade may also be used for earthmoving, such as the leveling of top dressing.

Rubber Developments (National Rubber Development Board, National Rubber Bureau, Washington, D. C.)

New Concrete Beam Testing Machine

for Third-Point Loading

New unit cost only $200, needs minimum maintenance, can be transported easily by one person.

By Hubert F. McDonell
Assistant Engineer of Materials and Tests
State Road Department of Florida

WHEN THE Florida state road department's latest specifications stated that concrete beams shall be tested by means of the third-point loading method, the department's old cantilever type beam testing machines became obsolete.

At this stage we were faced with the problem of purchasing five or six of the third-point loading machine that could be built for our use in the department's machine shop. After considerable study and experimentation we developed a machine that has given excellent service; results that have exceeded our fondest expectations.

The unit cost little to build (complete with special hydraulic jack, approximately $200) and even though our machines have been subjected to considerable service they have not required any maintenance whatever.

One of the many advantages of this machine is the fact that it weighs less than 100 lb. including the jack, and since it consists of two separate parts one person can handle it conveniently. According to several of our project engineers, this feature alone is worthy of comment because it is possible now for one man to test the beams without any assistance.

A Blackhawk Porto-Power hydraulic jack having a rated capacity of 16,000 lb. has proved ideal for testing 6" x 6" x 30" concrete beams. This jack is specially equipped with a flexible hose 6 ft. in length, a head 4¾ in. in height, a 4 in. diameter gage reading 0 to 20,000 lb. in 200 lb. increments and having a maximum indicator pointer. The base for the beam testing machine consists of a section of 2" x 8" channel 20 in. long, while the upper section consists of the same material and is 8 in. long. The upper and lower bearings are pieces of 1½ in. diameter round steel bars 7¾ in. long. They are balanced on a section of ½ in. diameter steel bar 1 in. long, spot welded to the base, and are held in place by meanas of a ½ in. width ring cut from 1¾ in. inside diameter pipe and having a metal strip ⅛" x 2" wide welded on the outside of the ring and to the base. This permits the bearing to rock up and down, and to move back and forth which insures a uniform bearing of the beam during the period it is being tested.

The 4" x 4" x ½" bearing plate on which the load is applied is balanced on a ½ in. round bar 6 in. long and is held in place by means of two ¼" x 2" bolts which permits it to rock freely on the ½" x 6" bar.

To further increase the efficiency of this machine a ½ in. width ring cut from the above mentioned 1¾ in. inside diameter pipe which is slightly larger than the jack head is welded in the center of the 4" x 4" bearing plate, thereby insuring that the load will be applied in the exact center of the bearing. The frame is made from ½" x 2" steel sections and is reinforced across the top with a piece of semi-circular steel section ½ in. thick and 2 in. high in the center and is the full length of the top.

Each of the upper and lower bearings is reinforced with a metal strip ¼" x 2" x 7" welded directly above the upper bearings and below the lower bearings.

The upper bearing block is held in position by means of two ¼" x ¼" x 2" metal strips welded on

● Hubert F. McDonell of the Florida road department, testing a 6" x 6" x 30" concrete beam on the new type third-point loading beam machine.

each side of which act as guides on each side of the frame and will permit it to be raised or lowered but always remains in position for the third-point loading. This is a feature that eliminates all of the usual measurements required for properly spacing the upper bearing. A wire bail attached to each side of the bearing block has been found to be very convenient in hanging it to the frame when lining up the beam prior to testing.

The lower bearings are spaced 18 in. on centers and the upper bearings are spaced 6 in. on centers which are the distances specified for a 6" x 6" concrete beam.

In most instances it is possible to obtain two tests on a beam 30 in. in length by placing the beam as far as possible towards one end for the first test. We frequently obtain identical results for both tests on the same 6" x 6" x 30" concrete beam.

This is an economical beam testing machine to construct since all connections are welded and no machine work whatever is required.

Engineers from several state testing departments, the Bureau of Public Roads and the Portland Cement Association have described this unit as being the most compact and efficient third-point loading concrete beam testing machine they had ever seen.

All New Jersey Interstate Funds Under Contract

State highway commissioner Dwight R. G. Palmer has announced that New Jersey is one of 18 states listed by the Bureau of Public Roads as having 100 percent of its 1956-57 Interstate and Defense highway funds covered by contracts advertised and funds obligated.

Commissioner Palmer said the extent of the progress made under the federal program is indicated in the over-all total of $71 million committed to highways during the fiscal year ending June 30, 1957. He pointed out that this figure compares with an average annual commitment of $25 million since the end of World War II, including 1954-55, and $36 million in 1955-56.

The $71 million total includes $45 million committed to new interstate freeways. The balance was for modernizing and extending the existing state highway system.

Interstate construction is under way on portions of four of New Jersey's eight Interstate routes.

Gunite Contractors Association Has Increased Membership

The following firms have been accepted for membership in the Gunite Contractors Association, Los Angeles: National Gunite Corporation, Boston, Mass.; Western Waterproofing Co., Inc., St. Louis, Mo.; Imperial Flooring & Waterproofing Company, Northlake, Ill.; Gunite Associates, Inc., Syracuse, N. Y.; Permanente Cement Co. of Los Angeles and Oakland, Calif.; and Riverside Cement Co., Southwestern Portland Cement Co., California Portland Cement Co., all of Los Angeles, Calif.

The association, with approximately 50 members in the United States and Canada, is a non-profit organization rendering free information and inspection service to public agencies, architects, engineers and contractors.

Details on membership as well as Brochure G-55-57, a textbook on Gunite, may be had by writing Gunite Contractors Association, 714 W. Olympic Blvd., Los Angeles 15, Calif.

More GIANT Sizes! More GIANT Tread Designs! More GIANT Savings!

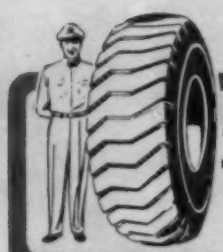
Now at SOUTHERN TIRE COMPANY!

Probably more dirt and rock is hauled on Southern Tire retreads than on any other retreaded tires. That's because more and more contractors and heavy equipment operators are discovering the superior quality and economy of Southern Tire retreads.

Southern Tire offers not only the country's most complete range of tire sizes and tread designs, but also the world's finest retreading facilities—three-sectional molds that mean no buffing to breaker strips regardless of growth.

These facilities and use of finest tread rubber, plus Southern Tire's long experience, assure better quality with greater economy. Call your tire dealer now for facts about how Southern Tire retreads can save you as much as 40% of the price of new tires yet give you guaranteed new tire service.

● **All sizes—from 1100 x 24 to 33.5 x 33**

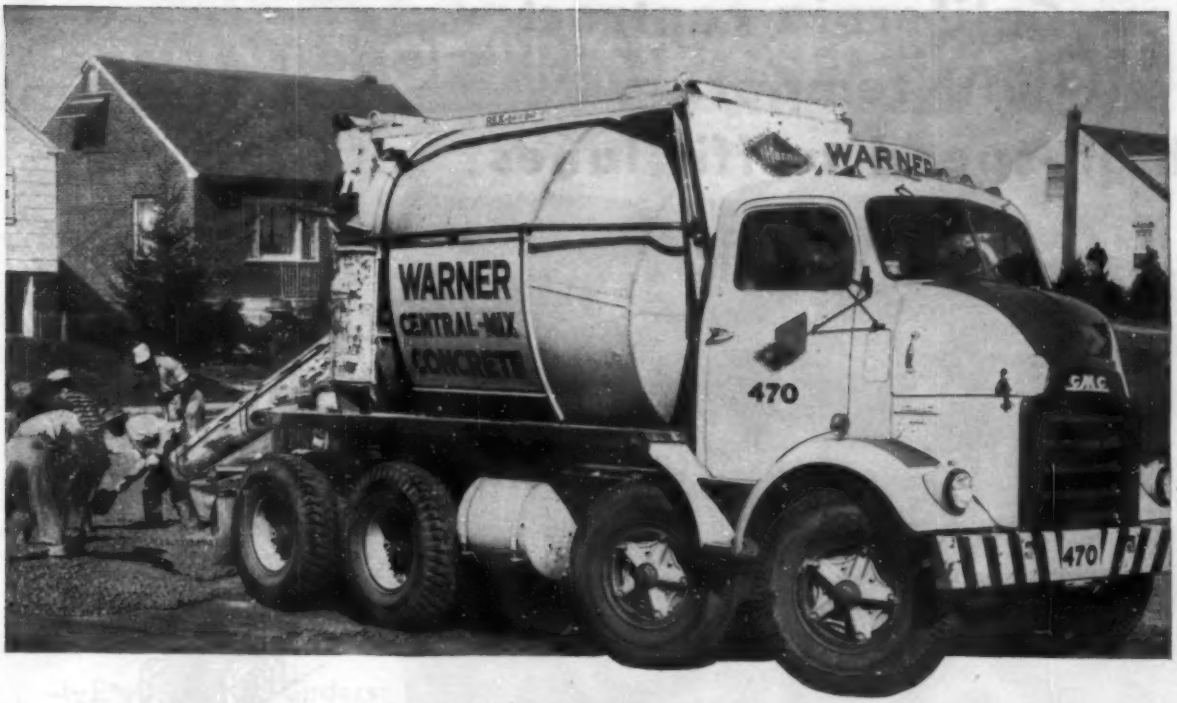


SOUTHERN TIRE COMPANY

1414 Broadway
SHEFFIELD, ALA.

Phone Collect
EV 3-2312

For more details circle 324 on enclosed return postal card



This unique GMC 12-wheeler hauls 9 legal yards within 60,000 GVW

Warner of Philadelphia—one of America's top three ready-mix outfits—uses GMC's to swing 2½ extra yards every trip

IT TAKES plenty of truck backbone to haul 18 tons of concrete. But Warner Company took advantage of GMC's enormous reserve strength—had an extra front axle installed locally for the desired weight distribution—and they have mixers that swing 9-yard loads!

That means each of their GMC FWX660's is hauling, in *two* trips, almost as much payload as their previous trucks delivered in *three*. Multiply that by the 26 GMC's in Warner's fleet, and you'll see how delivery costs take a nose dive.

"GMC gave us the ideal weight setup in an easy-to-maneuver c.o.e.," says Equipment Superintendent Charles Ponti. "What's more, these trucks have the ruggedness—and then some—to handle their big loads under the toughest conditions we ever meet."

The first of these GMC FWX660's was put to work in early 1956. How successful were they? Warner ordered 6 more eight months later. Then 3 more. Seven others were delivered this past March.

No mystery about the reason: "*On every job where we can use their full 9-yard capacity, we are making substantial savings,*" says Ponti.

Here, then, is another example of the way GMC's—of every size and type—are cutting costs for America's top construction firms. No matter what you haul—or where you haul it—check *all* the GMC advantages with your GMC dealer!

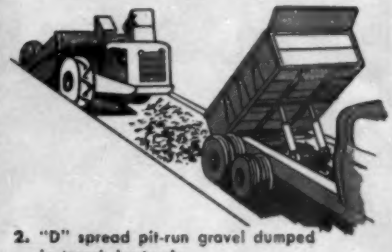
GMC TRUCK & COACH—*A General Motors Division*

... for more details circle 321 on enclosed return postal card

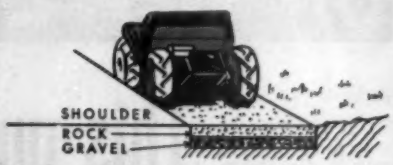
How California contractor built temporary high-speed traffic lanes

To shift traffic of the outside traffic lane, while repairing a long curve, Ball & Simpson Construction Co., Berkeley, California, built a temporary lane in the median strip of the busy 4-lane, Oakland - San Jose Freeway.

1. D Tournapull® cut flat trench 7' wide, adjacent to existing shoulder.



2. "D" spread pit-run gravel dumped in trench by trucks.



3. Tournapull loaded, hauled, and spread crushed rock over gravel, to prepare firm base for blacktop surfacing.

D 'Pulls* handle finish work, plus handyman dirtmoving

On the Oakland-San Jose Freeway (Hwy. 17) south of Hayward, California, Ball & Simpson Construction Co., Berkeley, handled 16 miles of road rebuilding and resurfacing. The job consisted of 2 segments. On the northern section of the job — known as Jackson Road Project — company's contract included dirtmoving, grading, concrete bridges, and all painting.

For sub-grade finish work on this north section highway, as well as on access roads, cloverleaf, etc., this contractor employed 1 of their 3 D Tournapulls. "D" cut high spots, filled the low to balance the final sub-grade and prepare for concrete paving. It also smooth-graded ditches, backfilled at bridges and overpasses, built-up and graded entrance roads and traffic interchanges.

Rents 4th 'Pull for southern section

On the Warm Spring Project — at the southern end of the 16-mile job — contractor rebuilt and blacktopped an existing 4-lane highway. Because the company's 2 other "D's" were busy on other work, Ball & Simpson rented a 4th D Tournapull for this section. It worked on odd-lot dirtmoving jobs similar to those illustrated at top of page.

Ball & Simpson also has three interchangeable 11-ton LeTourneau-Westinghouse Rear-Dump trail-units for their Tournapull prime-movers. These extra work-units keep contractor's prime-mover investment working full-time . . . come in handy for hauling shovel-loaded dirt in muddy, rutted or other difficult off-road conditions frequently encountered in their area.

Likes short-radius turnability

Says L. D. Mosier, company official, "We use 'D' scrapers for finish work because they're the *only* machine that can cut dirt on the short radiuses we encounter on these jobs." Supt. A. D. Ostrum reports, "We have a lot of subgrading and finishing work. Tournapull does an excellent job on these operations." "I'm sold," says operator Lew Jones. "On clean-up work, it's the best outfit I've ever run."

For profitable small-yardage and work-and-run type dirtmoving . . . for handyman clean-up, finish grading, and pioneering . . . you can't beat 29.5 mph, roadable, 9-yd. D Tournapulls. Find out how "D's" can cut costs on your jobs. Call or write for complete details and a demonstration.

*Trademark DP-1552-DCJ-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

. . . for more details circle 276 on enclosed return postal card

PORTFOLIO OF PRESTRESSED BRIDGES

Two Firsts in North Carolina

1—Prestressed I-Girders

THE FIRST major bridge to be built in North Carolina with prestressed I-girders was erected during the 1957 season. It is the Cape Fear River bridge on US 701 at Elizabethtown. The 1,177 ft. bridge parallels an existing one-way bridge which is being retained for additional traffic relief.

The new bridge consists of a 140-160-140 ft. continuous steel girder system over the channel; flanked by eight and six 52.5 ft. prestressed concrete spans respectively.

● New prestressed I-beam spans being erected at Elizabethtown, N.C., to provide new overcrossing of the Cape Fear River. Old bridge at right offers dramatic technological contrast.

● Another view of structure which marked North Carolina's entry into the prestressed concrete field for major structures. Span at left will support one end of the main channel span system of continuous steel girder construction.

● Delivery of the 52-ft.-long prestressed girders for the Elizabethtown bridge entailed a 115-mile haul by truck and dolly. Special design included enclosed steering shaft for rear wheels, operated from driver's seat.

● Girders at the N.C. Product Co. yard, ready for transport. Each 52-ft. girder contains 26 stressing cables which were pretensioned with jacks exerting 243 tons total force.

● The concrete piling at right will hold the bulkhead in place for the new Beaufort-Morehead City bridge on U.S. 70. A coal burning steam boiler for furnishing power to the pile driving hammers is shown. The east end of a temporary work bridge is also shown.

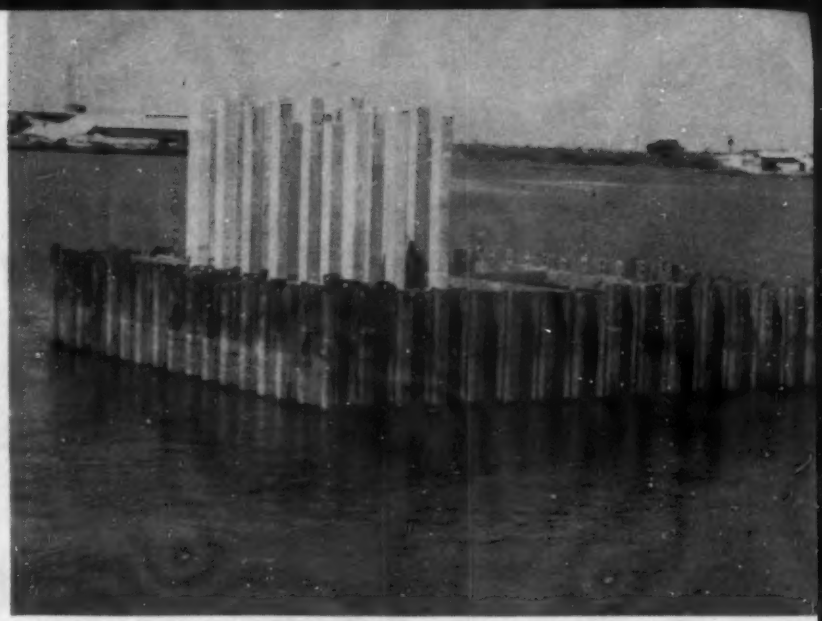
These spans rest on concrete post and beam bents which are supported on timber foundation piles. The bridge has a 28 ft. roadway and is designed for H20-S16 loading.

Pictured here are the 36" x 52' long I-type girders, each weighing 11 tons, as built and delivered by N.C. Products Co. at their plant at Durham.

The bridge was designed by the North Carolina State Highway Commission under Chief Bridge Engineer T. B. Gunter, Jr., with R. L. Wicker, resident engineer. Wannamaker & Wells, Inc., of Orangeburg, S.C., erected the bridge on a bid of $701,689, with a tentative completion date of November 30, 1957.

II—Prestressed Piling

Another "first" in North Carolina during the past year was the use of prestressed concrete piles for a new bridge on US 70 at Beaufort. The structure which replaces an old bridge seriously damaged by hurricanes several years ago is 673 ft. long, comprising six 38-ft. reinforced concrete deck girder spans, one 141-ft. bascule span, and eight 38-ft. concrete grider spans. This bridge will have a 28-ft. roadway with flanking sidewalks and is designed for H15-S12 loading.



● **Some of the 12-inch square 49-foot-long prestress concrete piles have been spotted inside the cofferdam and ready to be driven for one of the bascule piers for the new Beaufort Channel bridge.**

The concrete girder spans are supported on precast concrete 20" octagonal piles, supporting concrete caps 3'2" x 2'6" x 33'. The bascule span required a total of 202 prestressed concrete piles, 12 in. square, each pile being 49 ft. long.

This bridge was designed by L. O. Hopkins, consulting engineers, Nashville, Tenn. J. H. Burrus has been resident engineer for the State Highway Commission. See accompanying pictures for details of this project.

● **Precast concrete piles ready to be used on the new Beaufort Channel bridge. The casting yard for the piles was built on a hydraulic fill along the edge of the channel and near the site.**

97 Ton Prestressed Girders Set With Special Gantries

About two girders a day were poured with transit-mix batched in a Butler plant with 100-ton bin. Post-tensioning operations began when concrete reached 4500 psi. (5500 psi required at 28 days.) Grouting was forced into small circular openings seen plugged in heads of tendons. External and internal vibrators were used.

Girder being trundled out over the piers into position by rail-mounted gantries supported by falsework trusses. The trusses are so designed that by removing the center section, a 48-ft. section and two 36-ft. sections remain. Here is seen a 72-ft. girder being placed, on what is said to be the first railroad bridge in America built of prestressed concrete.

Post-tensioning steel being assembled for a 120-ft. girder. Each girder has 12 tendons individually containing 16 quarter-inch, stress relieved, high tensile strength wires meeting 240,000 psi test specification. Tendons seen attached to bulkhead manufactured in Colorado Springs by Prescon. Wire is made by American Steel and Wire, and by Roebling. Girders were built at the site because of size.

More Pictures on Next Page →

PRESTRESSED concrete girders of record length and weight were set recently near Colorado Springs, Colo., where six bridges were under construction on roads at the U.S. Air Force Academy. The members are prestressed, post-tensioned concrete weighing about 97 tons maximum. The bridges include 112 girders 120 ft. long and 16 girders 72 ft. long.

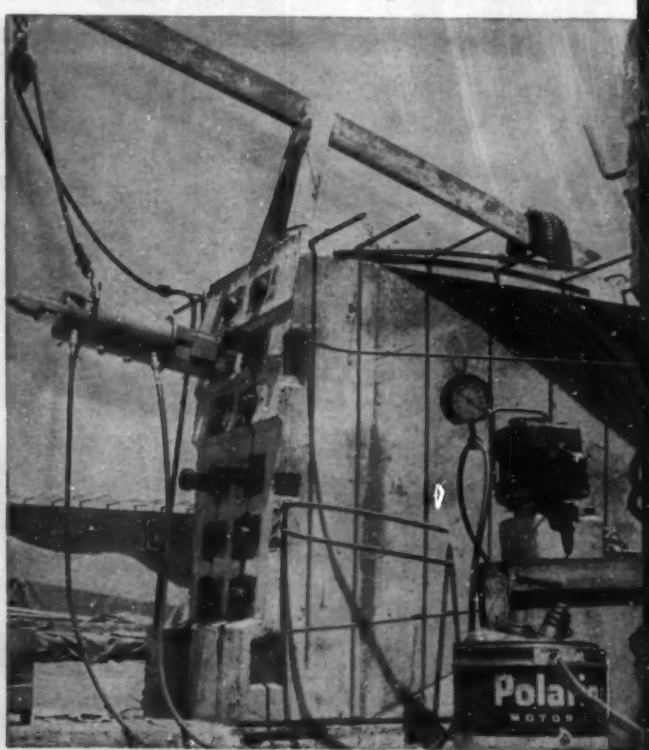
The most interesting problem confronting the contractor was the placement of the giant girders, which was not considered feasible by means of a crane. The solution came in the form of two unique steel gantries designed and fabricated under the direction of L. Boduroff, structural and consulting engineer, now of Denver.

The gantries were designed to straddle a girder, lift it with a Wright 50-ton chain hoist, one for each girder, and transport the girder to position on special rails.

This railroad bridge project is here pictured for the interest of *Roads and Streets* readers, many of whom today are engaged in the planning, designing or construction of prestressed concrete bridges and grade separations in the highway program.

The bridges were designed for the Air Force by Dr. F. R. Khan of Skidmore Owings & Merrill, Architects-Engineers, assisted by A. J. Brown, structural engineer. Horner Construction Co. of Denver were general contractors, with John Brown, project manager, Carl Boulden, general superintendent, and Robert Thompson, engineer. Prescon Corp., Rocky Mountain division, was subcontractor with tendons performed post-tensioning under supervision of Edgar A. Rodziewicz, with W. C. Bickley, field superintendent. Air Force Construction Agency directed by Col. Albert Stoltz.

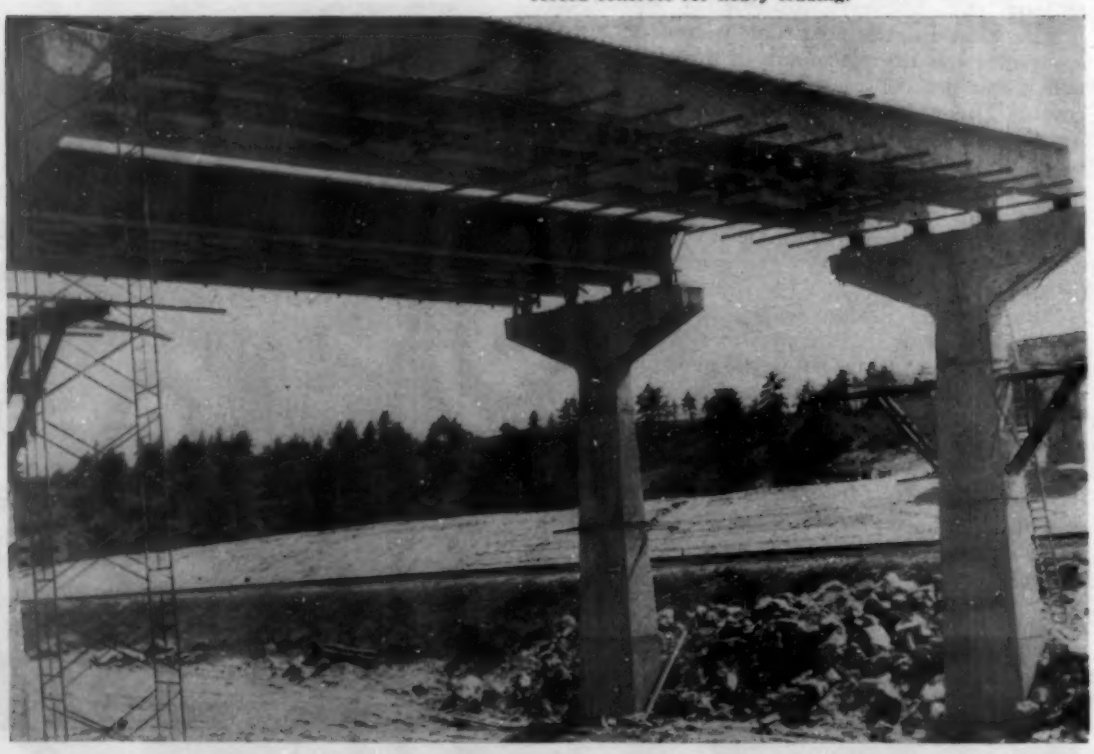
Concrete here has reached strength of 4500 psi and post-tensioning is being performed, using Simplex gasoline engine driven hydraulic jacks. Both tendon ends were placed under tension at same time, to minimize internal friction. Tendons were stressed to 170,000 psi. After stressing, steel shims were inserted between head of tendon and end of girder, as shown.



The specially built gantries are now moved into place by winch truck or tractor and cables. The 50 ton chain hoist is hooked to a steel eye set in the girder. When each end of the girder is secured it will be raised by the crew in readiness for transporting and setting.

Test in progress on a girder with integral slab. Ten 50-ton jacks were placed atop the girder with beams over them. Cables were extended through the beams and anchored to caissons buried to depth of 15 ft. Deflection during test typically reached about 11 in. at center of girder. Specifications required the structure to withstand 27.5 tons on each jack before failure.

120-foot long girders in place at Academy site on Monument bridge. Note slender proportions, eloquently dramatizing the dead weight saved by the pressed design, as compared to conventionally reinforced concrete for heavy loading.



Prestressed Concrete

Girders Rolled Out on Dollies

● The two special I-beam-straddling dollies, spotted at the abutment and awaiting the next T-beam arrival.

THE PRECAST, prestressed "T" girders for this bridge were lifted by a crane, one by one, on specially built dollies and rolled out on the bridge on falsework beams. A total of 36 beams, each 80 ft. long and weighing 35 tons, were required for the 17 spans.

The structure is an overpass on U.S. 40 relocation where it crosses Route 106 near Hercules, Calif. The contractor: McCammon-Wunderlich Co., East Palo Alto, Calif.

The dollies, here pictured, consisted of two framed units welded from standard structural shapes and mounted on flanged wheels. Wheels were designed to ride the

● Portable electric welding unit supplied current for splicing falsework beams.

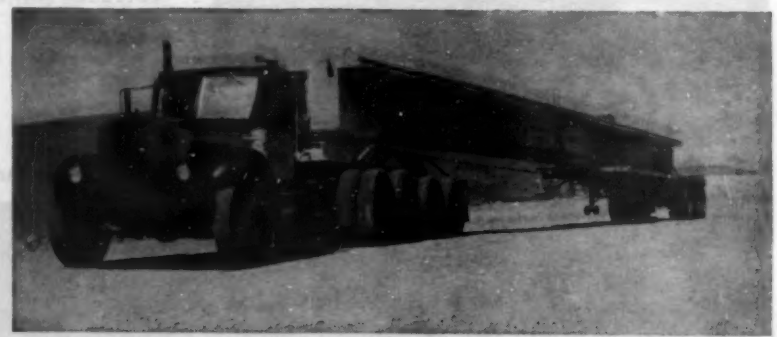
● Setting one of the 35-ton T-beams. The crew averaged six a day after the start.

● **Pair of framed falsework I-beams being lifted off to make room for setting the last two concrete T-beams in the panel.**

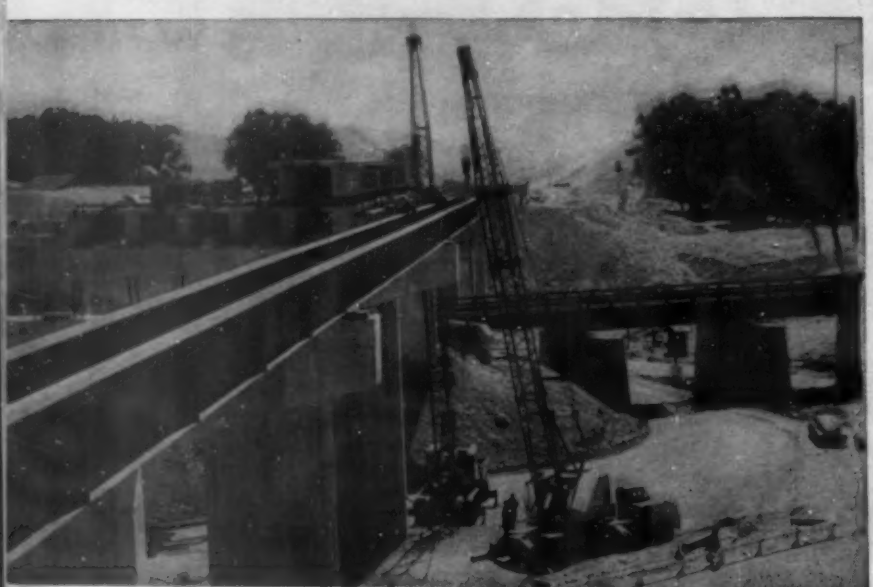
top of a pair of I-beams. Each dolly included a cross-beam which supported the concrete beams. A hinged steel bar at each end (again see picture) was raised to vertical position, the concrete beams were then set on the dollies, spaced out toward the beam ends, the bars were placed against the web to stabilize the beam, and the beams were ready to move.

The steel beams are connected 4 ft. apart by welded bracing. The paired falsework beams thus formed a substantial structure having stability against overturning under load of a heavy precast "T".

The falsework beams were fillet-



● **Mack Trailiner 16-tired truck tractors with front beam and rear dolly transported the 35-ton T-beams. The load had 18 tires in front and 12 in the rear. The rear dolly consisted of the chassis of an over-the-road flatbed and semi-trailer, its bed strapped against the underside of the castors riding free.**



● **Looking along the falsework beams. Pair of 70 ft. booms in action handling the setting.**

welded to make them continuous over two or three spans, for alignment.

The concrete beams were manufactured by Basalt Rock Co. at their Napa plant, 30 miles away, and shipped by Dalzell Rigging Co., using Mack Trailiner trucks and special trailer. The beams were set on the construction dollies from one end of the bridge using a single crane, and rolled out by means of a cable and drum from a second crane on the ground below. A P&H Model 555A, 35 on truck crane and a Lorain motor crane owned by Dalzell Rigging Co., of Emeryville, Calif., handled the job.

Erection began by setting all concrete beams from abutments toward the center of the bridge. The last two concrete beams for each span were set off temporarily on the top of beams already in place, while the steel falsework I's were burned away from that panel and removed. Then the two remaining concrete beams were given their final setting, and the procedure repeated at the next panel. An average of six beams were set daily after getting started.

The other half of the bridge was similarly constructed from the other end, and the bridge deck was ready for PMS.

The bridge was designed by the bridge department of the California division of highways, with Jerry Oliver bridge dept. representative and Vincent Smith, construction engineer, San Francisco state highway district, in charge. Floyd Helin was project manager for McCammon Wunderlich.

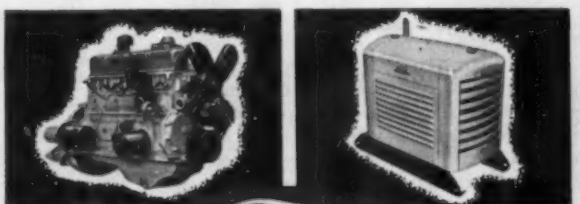
Cuts vibration... provides smoother performance ...lengthens bearing life

Thirty-one pounds of added strength—in the form of deep-block construction—pays Ford power users big dividends in engine stamina and performance.

With Ford deep-block construction, the sides of the block extend below the crankshaft to provide a full 240° bearing support instead of the ordinary 180°. This maintains a more precise bearing alignment . . . cuts vibration and reduces wear . . . results in longer bearing life.

A few more long-life bonus features Ford industrial engines offer you are: free-turn valves that resist burning, Full-Flow oil filter that cleans *all* the oil and low-friction short-stroke design that delivers more *usable* power from every drop of fuel, saves on ring wear. These engineering advancements combine to give Ford industrial engines the ability to shrug off rugged daily pounding . . . stand up longer in heavy-duty industrial work.

Whether it's 4-, 6- or 8-cylinder power, see your Ford Industrial Products Dealer. Have him show you Ford's complete line of engines . . . including the new super-efficient 220 cubic inch diesel. You'll find there's a Ford engine that's right for *your* job.



Ford
INDUSTRIAL ENGINES
AND POWER UNITS

INDUSTRIAL ENGINE DEPARTMENT • FORD Division of FORD MOTOR COMPANY • P. O. Box 598, Dearborn, Michigan

YOUR JOB IS WELL-POWERED WHEN IT'S FORD-POWERED!

. . . for more details circle 261 on enclosed return postal card

For Citizens Who Ask:

What About By-Passes?

This statement is part of an informative illustrated booklet which has been published by the Wyoming Highway Department to aid in winning the cooperation of citizens of smaller communities which may be by-passed by Interstate relocations.

The question of highway by-passes has probably been discussed more than any other feature of the Interstate program. Many well-meaning individuals have expressed opinions about the subject without knowing all the facts.

By-passes are certainly not unique to the new program. They have been in successful use in many eastern and far western states for a number of years. The experience gained in those areas has enabled highway planners to adopt the most successful features of by-pass routes for the Interstate standards.

One very important fact highway administrators have discovered is that by-pass or marginal routes are most successful in smaller communities. They can be constructed at relatively low cost within a short distance of the affected community.

Routes Siphon Traffic

When constructed, by-pass routes siphon non-stop traffic off of congested city streets thereby preserving their value as traffic arteries for the local community. This allows the city street to be used for business purposes with more available parking area for those interested in doing business, thus benefitting the community. It must be remembered that a certain percentage of motorists do not wish to make a stop in a particular city or town. To route these motorists through the city adds to the general congestion and increases traffic hazards on the main route through the city.

So by-passing a town does not mean that the city is cut off from the main highway or the valuable source of revenue provided by the traveling public. It simply provides an alternate route for heavy commercial vehicles and non-stop motorists. If the Interstate highway with its high standards, wide right-of-way, controlled access, and other design features were constructed through the center of town it would, in most cases, completely ruin the business district. Even if the adjacent business establishments were not taken by the wide right-of-way there would still be no means for the motorist to get on or off to do business in front of the businesses for local traffic.

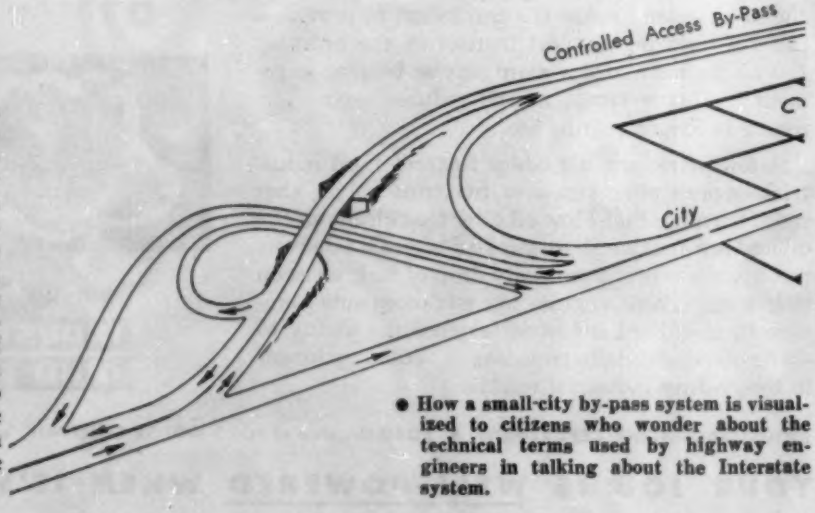
In large metropolitan areas, since it is often infeasible to route traffic completely around a town, it has been necessary to construct elevated expressways through the heart of the town which are extremely complicated and very costly and provide little business opportunity to the motorist.

In smaller communities throughout the country where by-pass routes have been constructed, the subsequent number of businesses may be adversely affected by a by-pass route more or less temporarily but the general effect on the entire community is an improved one. Reports by the United States Chamber of Commerce and highway research groups show that in the overwhelming majority of cases, retail sales and general revenues in by-passed towns increased by a larger percentage than the national average.

One of the main benefits derived from controlled access by-passes is the enormous increase in, and stability of, land values, with a resultant increase in tax collections.

Wyoming Highway Act

In Wyoming, as in other states, the 1956 Highway Act provides that public hearings be held in communities where any highway relocation is planned. The residents of those towns thereby have the opportunity to express their views on the subject and have a chance to evaluate all the facts concerning a by-pass route. Furthermore, the highway department will make careful studies of all the facts in each particular case and take the views of local residents into account insofar as possible and



● How a small-city by-pass system is visualized to citizens who wonder about the technical terms used by highway engineers in talking about the Interstate system.

still stay within the standards established for these routes.

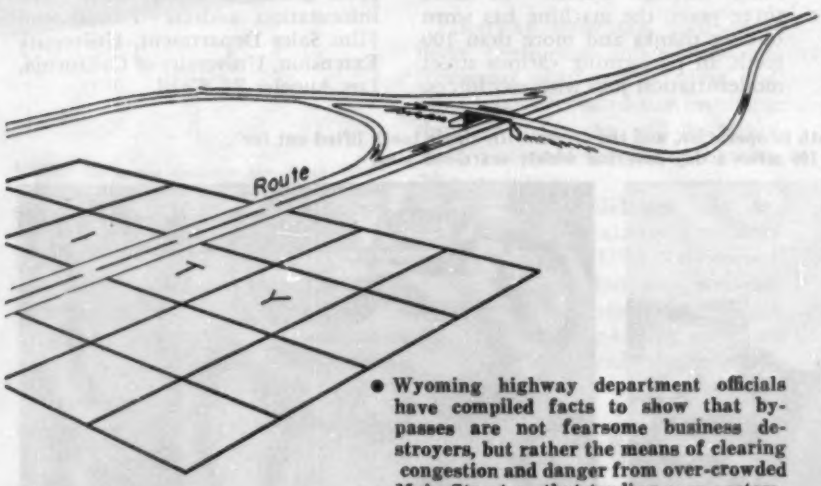
The illustration shows the manner in which a by-pass route may be constructed around a town. Interchanges at either end of town will allow non-stop motorists to proceed without delay and give other motorists equal opportunity of taking the city route. The department plans to erect large, reflectorized signs well in advance of these interchanges so that motorists will know which lane to take for the city route and where tourist facilities are located in the town.

Effect on Business

The illustration cannot be considered as typical since local conditions will determine the exact type of separation structures to be built, but it does depict two types of interchanges recommended by national authorities. From the drawing it can be seen that motorists will be able to get on or off the Interstate highway at either end of the city.

Since the highway department will have strict control of access along the by-pass route, businesses will not be able to build along the by-pass route. This feature will preserve the value of the Interstate route as a traffic artery and it will protect local merchants since competitors will not be able to establish along the marginal route.

Wyoming's only experience with by-passes at this time has been at Buffalo. The Chamber of Commerce, businessmen and citizens are high in their praise of its beneficial results. Even businesses such as a men's wear shop and a tire retail shop have reported benefits.



● **Wyoming highway department officials have compiled facts to show that by-passes are not fearsome business destroyers, but rather the means of clearing congestion and danger from over-crowded Main Street so that trading-area customers can find a place to park and do business.**

"Limited access does not mean denial of access." This is the point that has been emphasized at State-County highway meetings throughout Colorado recently in discussing proposed freeway routes under the federal highway program. In amplifying on this subject, Thomas J. Wark, highway commissioner of Montezuma county, said, in a recent conference, "An understanding of why the new, wider roads should be built with controlled access—to provide for the traffic needs for the next 20 years—will relieve doubts and apprehension among property owners about what the roadbuilding may do to adjacent properties."

Thesis on Subsurface Exploration Technique

Engineering Subsurface Investigations by the Earth Resistivity Method, by C. R. Lennertz. M. S. Thesis, Purdue University, Lafayette, Ind., June 1953. Highway Research Abstracts (republished), Sept. 1957.

This thesis reports the results of an investigation that was undertaken to establish the applicability of the earth resistivity method of subsurface exploration to specific conditions and engineering problems existing in Indiana. The primary objective of the study was to develop detailed procedures for use by the Indiana State Highway Commission for foundation and general subsurface exploration surveys.

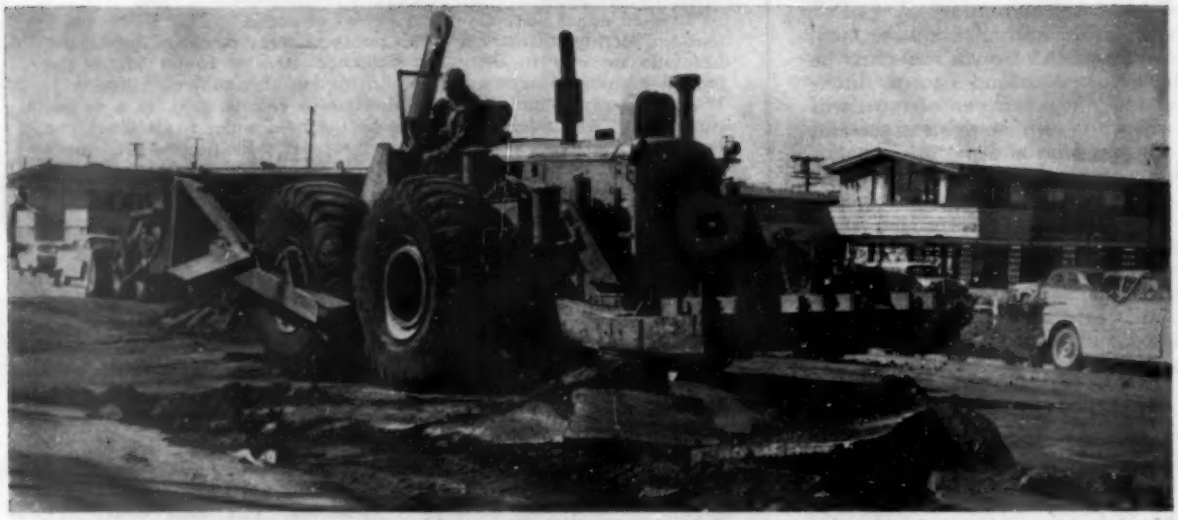
The electrical resistivity method of subsurface exploration consists in identifying changes in the character of subsurface materials through measurements of the electrical resistance of these materials. A generally complete discussion of the theory of this method is presented. This discussion is intended for use by practicing engineers. A definite attempt was made to include all pertinent information, yet keeping the discussion as simple and direct as possible.

The general procedure followed was to run resistivity tests by the standard methods at a number of sites where subsurface conditions were known from borings. These sites were selected in an attempt to test as great a variety of subsurface conditions, native to this region, as possible. The data obtained was analyzed by a selected group of the published methods of interpretation. Each method of interpretation was evaluated relative to its application to the specific conditions explored and a final evaluation of the resistivity method as a whole was made as applied to the particular problems here encountered.

● *The results* of this study indicated that only several of the above mentioned methods of interpretation are generally applicable to the subsurface conditions and problems encountered in Indiana. They did indicate, however, that by using these methods of interpretation with the aid of some type of corroborating information, accurate and dependable interpretations as to depth and type of bedrock and the nature and structure of the overlying material as well as indications of lateral changes in structure and material can be made by electrical resistivity methods.

This thesis also presents a Manual of Instructions for Earth Resistivity Surveys which gives detailed procedures for the determination and interpretation of both vertical and horizontal electrical resistivity profiles as used in connection with subsurface exploration for engineering purposes in Indiana.

● Bids for 187 miles of state highway improvements were taken on a single day recently by the Kansas Highway Commission. The work was scattered among 34 counties. This is part of a program that is setting a new record for mileage and dollar cost in 1957 in this state.



● The special ripper used on Los Angeles street work shown cutting with a single tooth. The frame provides for as many as five staggered teeth, and the hydraulic system for raising and lowering the frame from the same oil reservoir used by the tractor's torque converter.

Rubber-Tired Ripper

"Slices Macadam Like Butter"

CONTRACTORS are usually supposed to be "one up" on city maintenance organizations in devising faster and more powerful methods of performing street work. But not in the case of the Los Angeles Department of Public Works. The department leaders have produced a highly successful unit by designing a special ripper attachment for a LeTourneau-Westinghouse Model C Tournatractor.

This machine has high mobility for traveling about over the far-flung system of 4800 miles of street in Los Angeles. Yet it has the ripping power of many a crawler-tractor, according to on-the-job reports.

When department engineers sought to devise such a unit, they selected the C Tournatractor, and with the help of a local distributor (Crook Company) developed a ripper which can use as many as five teeth or as few as one or two.

This machine has been in operation for the past three years with entire success. According to the supervisors at the city equipment yards, it has power enough to "slice through a macadam street like a hot knife through butter." In these three years, the machine has worn out six shanks and more than 100 teeth, in performing various street modernization jobs with city forces.

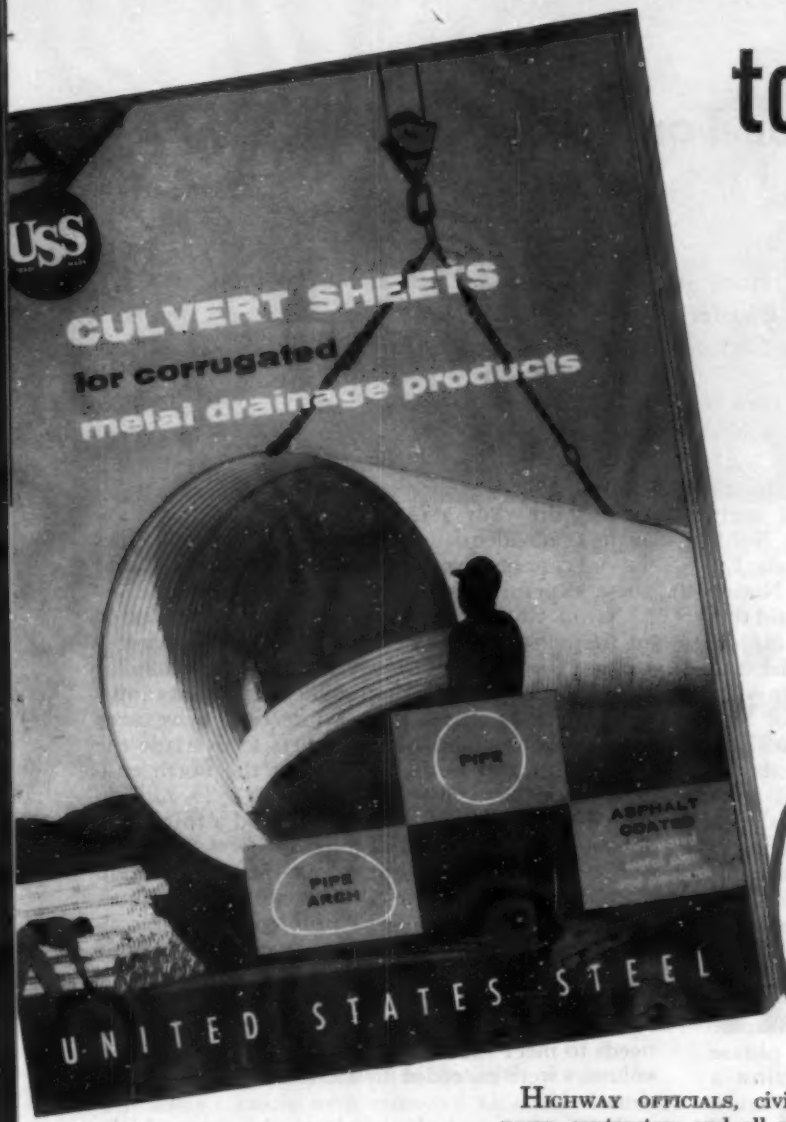
Driver Education Film Helps Analyze Causes of Accidents

A new 16 mm, 12 minute black and white motion picture film entitled "Impact" has been released by the University of California at Los Angeles. This educational film helps traffic experts and others analyze the mechanism of accidents and injuries, through slow-motion pictures and use of dummy occupants of vehicles.

Film available with sound at price $55.00 or rental $2.50. For information address: Educational Film Sales Department, University Extension, University of California, Los Angeles 24, Calif.

● Details of the ripper showing one tooth in operation, and the frame with single tooth lifted out for traveling. This machine often makes 100 miles a day covering widely scattered jobs.

This new booklet tells you how to build better drainage structures



...FASTER
...CHEAPER

it's Free

HIGHWAY OFFICIALS, civil engineers, contractors and all who are concerned with road building and other types of construction involving drainage problems will certainly want a copy of this comprehensive 28-page catalog.

This new booklet not only describes metal drainage products fabricated from USS Galvanized Culvert Sheets, but also contains helpful suggestions for installing these strong, long-lasting, low-cost corrugated metal culverts.

Drainage structures fabricated from USS Galvanized Culvert Sheets readily absorb the impact and vibration of modern traffic and can carry proportionately heavier loads than rigid-type structures. They are not subject to breakage, require no maintenance, cost less to install and are easy to ship and handle.

For your free copy of this valuable booklet, send your request to United States Steel Corporation, Room 2801, 525 William Penn Place, Pittsburgh 30, Pa.

NOTE: For larger drainage structures, USS AmBridge Sectional Plate is available in a complete range of standard sizes to satisfy design requirements for various types of terrain and waterway openings. These flexible structures with their heavy-duty corrugations can resist extremely large externally applied loads. For details, write American Bridge Division, Room 1801, 525 William Penn Place, Pittsburgh 30, Pa.

. . . for more details circle 303 on enclosed return postal card

USS GALVANIZED CULVERT SHEETS

USS

United States Steel Corporation, Pittsburgh · Columbia-Geneva Steel Division, San Francisco
Tennessee Coal & Iron Division, Fairfield, Ala. · United States Steel Export Company, New York

KEEP OUR ROADS ON THE GO

UNITED STATES STEEL

Design Standards for Tomorrow's Traffic

A review of design fundamentals, as outlined informally by Charles M. Noble, Ohio's Director of Highways, before the Detroit convention of the Institute of Traffic Engineers.

If we do our highway design job properly for today, tomorrow will partly take care of itself. This was the theme of a talk by Charles M. Noble before the convention of the Institute of Traffic Engineers, held September 23-25 in Detroit. Noting that some of the obstacles are "mental," he said that the engineer needs to have the courage to do his job.

Commander Noble, who was a Seabee leader during the War, helped build the original Pennsylvania Turnpike, was state highway engineer of New Jersey, and served as chief engineer of the New Jersey Turnpike during its construction. Today he is Ohio's director of highways.

The Commander's chief concern today is with the problem of seeing—and building—far enough ahead. Engineers today must design in anticipation of the explosive population growth that will put 100 million cars and trucks (compared with today's 67 million) on the nation's streets and highways within the lifetime of the facilities being planned today.

A common saying is that the project "must be economically justified," a high-sounding phrase which has been used repeatedly for or against a project. The speaker reminded that there are a lot of intangibles more important than dollars and cents. "If we hadn't used that phrase we would have a better highway system today for today's problems," he said. Many of our roads are totally inadequate and very dangerous. An obsolete road today entails a great economic loss; the old highway must be torn out and rebuilt, and this is necessary often because past policies of "hand to mouth" construction.

The speaker noted that much of the past construction has been justified to meet the pressing need for a *surface*—to get the country out of the mud. Then, the prime necessity was to build up a connected road system for the country, which meant stretching the dollar.

Today that time is past, Noble continue. Much of the job now must be good enough for a long while. But many people do not have faith in the future of this country. "The past is only a prelude," he reminded.

Even now we have many designs which stop a little short—only a few dollars more would have made them adequate. That is why judgment comes in—we cannot anymore afford to constantly rebuild these expensive facilities.

As an illustration Commander Noble referred to the personal experience of directing the design of the New Jersey Turnpike. Traffic estimates for the turnpike made by reputable consultants justified only four lanes. It took intercession by three businessmen commission members to overrule the consultants and build six lanes at the north end. Then—less than five years later—a $25 million widening project was necessary to add a third lane for an additional 61 dual miles.

"In my opinion the engineer must be more than a calculator," said the Ohio director. He must know *when* to spend. The problem of some construction agencies is that they never have enough money to spend adequately for good construction.

Again citing an example, the speaker referred to 1948 figures compiled on Ohio's state highway needs to meet 1970 traffic volumes. The estimated volumes were exceeded by 1954—16 years ahead of time.

A reference was also made to the recent highway planning conference at Hartford, sponsored by an insurance company. At that conference it was predicted that the nation would have 50 million more population by 1975, largely concentrated in urban areas. And that 100 million vehicles would have to be accommodated by that date, compared with only two-thirds that number today. The speaker cited these staggering figures to show the burden on today's highway designer . . . "but we still have people of too little faith, too little vision, who think we are spending too much for our arterial facilities."

In getting down to cases, Commander Noble pointed out a number of things which he considered basic to the over-all problem facing the highway designer and the traffic engineer. Some of these:

- The only permanent thing about a highway is the

(Continued on page 103)

Four of many Caterpillar-built machines on the Great Falls Paving Project: two DW15 (Series E)-No. 428 LOWBOWL Scrapers, a D8 Tractor and a No. 12 Motor Grader. The blocks in this area of the project are 430 feet long, and the street width 35 feet. Excavation of heavy clay soil averaged 525 cubic yards a block here.

HIGH PRODUCERS IN NARROW STREETS

New CAT* DW15 (Series E)-No. 428 LOWBOWL Scrapers set fast pace on $4,186,721 Great Falls Paving Project

Four firms associated under the name of City Constructors were awarded the contract to handle the Great Falls Paving Project, Montana. The project involved the reconstruction of about 900 blocks. Among the new Caterpillar DW15 (Series E)-No. 428 LOWBOWL Scrapers on the job were these two units, owned by S. Birch Inc. & S. Birch & Sons Construction Co. Here you see them at work in heavy clay soil on a typical 35-foot-wide street.

The street was excavated to the depth of a foot for rebuilding. Loads were restricted to avoid damage to utilities and improved streets. Averaging 12 cubic yards a load, each unit made five trips an hour on a 3,000-yard round-trip haul through traffic.

This is just one of many jobs where the new DW15 (Series E) unit proved itself a high producer. In fact, in reports from other jobs, this point is clear: When the new DW15 is compared with competitive units of similar capacity, it leads the pack in performance. Many factors contribute to its superiority. For example, it has a high travel speed of 37.2 MPH with the stability of four wheels. Very maneuverable, it turns within a 35-foot diameter, and its stability permits short turns at high speeds. Its wide-section 26.5 x 25 tires provide maximum flotation. And the new No. 428 Scraper's LOWBOWL design means a faster loading rate clear to the end of the loading cycle.

The new DW15 (Series E) delivers 200 HP (maximum output capacity). The new No. 428 has a capacity of 13 cubic yards struck, 18 cubic yards heaped.

. . . for more details circle 247 on enclosed return postal card

Your Caterpillar Dealer, who backs you with prompt service, will be glad to show you cost-of-operation figures on actual jobs. Better still, name the date—he'll demonstrate, right on your job!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

ONE GOAL: To concentrate our capabilities, resources and experience on the design, manufacture, distribution and service of job-tested heavy equipment.

THE LATEST, MOST COMPLETE INFORMATION ON THE NEW HIGHWAY PROGRAM—FREE

Here in one booklet is *all* the latest information on the new highway program. Find out how, where and when the money will be spent; standards for the new freeways; final routes of the Interstate System. Everything you need to know to share in the greatest construction job in history.

DEPT. RS-11, Caterpillar Tractor Co.
Peoria, Ill.

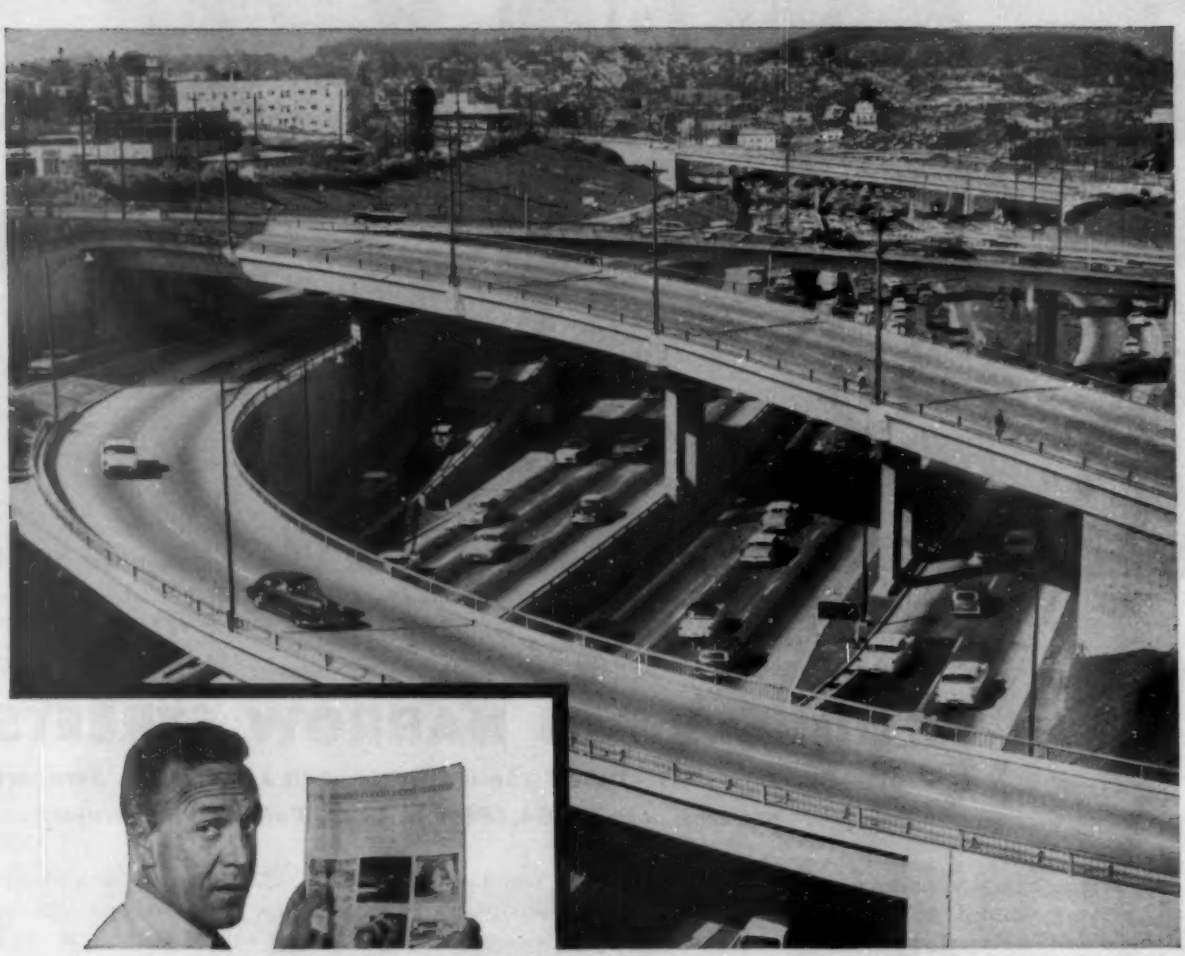
Please send me immediately
——— copies of "The Road Ahead."

Name_____

Company_____

Address_____

City_____ Zone____ State_____



Look of the future on newest highways calls for new-type concrete. Shown, interchange in Los Angeles.

What's all this talk about

NEW-TYPE, SOUND-CONDITIONED CONCRETE FOR THE INTERSTATE SYSTEM?

It's timely talk—in a new, informative series of PCA magazine messages to create fuller appreciation by the public for the finer, smoother-riding concrete highways being built today.

Significant advances mark today's newest concrete pavement. Highway engineers know about them. (Actually you may have helped develop them.) But—the *public*? Too few know of these advances . . . now so vital on the new Interstate System.

Take *sound-conditioning*. Admittedly, not a highway engineer's term! But it literally defines what has been done to concrete by use of narrow sawed joints for contraction control. The "thump" sound is gone—a dramatic advance! Drivers enjoy a quieter ride.

There's air-entrainment, too—and the granular subbase: both solved technical problems. But by insuring a lastingly smooth, level surface, they add new pleasure to driving. These and other advances today give people a pavement that is truly *new-type*.

All this needs telling. PCA's new nationwide campaign will do that—in non-technical talk the public can understand. An informed public means an appreciative public. This can simplify your job . . . it can help speed construction of the new Interstate System.

HERE TODAY! MORE COMING!

The public is enjoying new-type, *sound-conditioned* concrete on:

Ohio Turnpike
Atlanta Expressway
Hollywood Freeway
New York Thruway

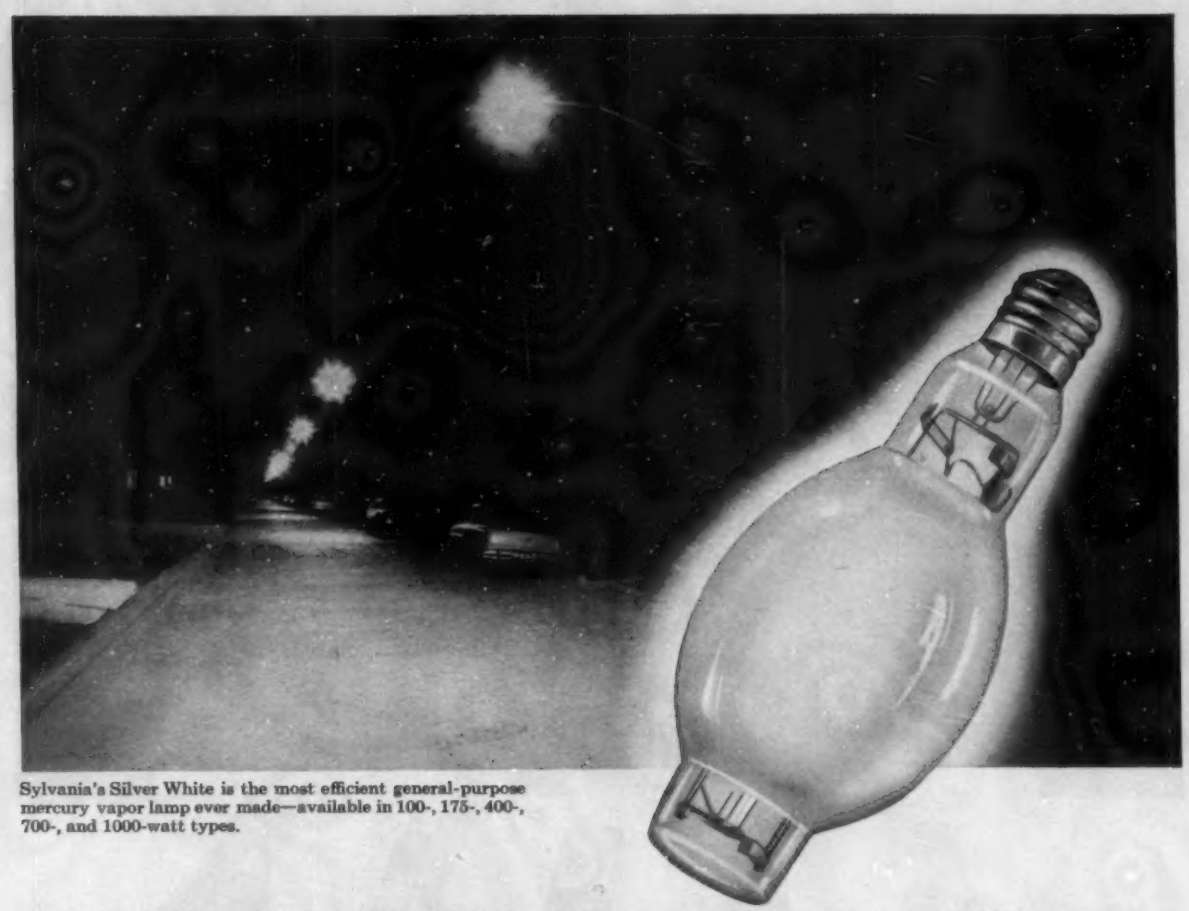
and more than 3,500 miles of other modern highways.

NEW-TYPE Concrete

PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of concrete

. . . for more details circle 311 on enclosed return postal card



Sylvania's Silver White is the most efficient general-purpose mercury vapor lamp ever made—available in 100-, 175-, 400-, 700-, and 1000-watt types.

Sylvania's Silver White Mercury Lamp gives Chicago 60% more light—reduces power costs 30%—cuts replacement 50%!

The city of Chicago is now changing over from its present incandescent street lighting to new Sylvania Silver White Mercury Vapor Lamp lighting—and with good reason!

By using Sylvania's 100-w. Silver White lamp, street light output has been boosted from about 2500 lumens to 4000 lumens per lamp—lighting sidewalks, lawns and homes that previously got little or no light.

In addition, wattage consumption was reduced from 189 watts per incandescent lamp to only 130 watts for the Silver White lamp and ballast combined—a substantial power reduction of more than 30% per lamp!

Lastly, replacements will be reduced some 50%. This important work- and money-saving change is the result of the Silver White lamp's 6000 hour rated life as compared with the 3000 hour group replacement life of the incandescent lamp.

Combine with these important economies the added benefits of crime reduction, traffic safety, and community pride. Together, they represent the major reasons why Sylvania Silver White Lamps are fast becoming the standard for mercury vapor lighting on streets and highways across the nation.

Sylvania's Silver White is actually the most efficient general-purpose mercury lamp ever made . . . delivers as much as 20% more lumens than previous color-improved lamps of equal wattage . . . yet costs no more to buy or use.

Let your Sylvania Representative demonstrate the service superiority of the Silver White—and the important economies it can offer you. Call him today . . . or write:

SYLVANIA ELECTRIC PRODUCTS INC.
Lighting Division, Dept. 7L-7211
60 Boston Street, Salem, Mass.

In Canada: Sylvania Electric (Canada) Ltd.
Shell Tower Building, Montreal

SYLVANIA

...fastest growing name in sight!

LIGHTING • RADIO • ELECTRONICS • TELEVISION • METALS & CHEMICALS

... for more details circle 308 on enclosed return postal card

BEAUTY...OR BEAST?

We'd be the last to claim that Amsco® Dippers have any inherent glamour. That's why we induced the pert 115-pound* blond to pose in one of our 7-yd. dippers at a recent trade show. Got a lot of attention, too!

But we know that experienced operators *specify* these all-cast Manganese Steel Dippers because they're real "beasts"—when it comes to strength and ruggedness. By way of proof, glance at the other photo. It shows a 9-yd. Amsco Dipper hoisting a 60 to 70-ton* rock out of the St. Lawrence Seaway Channel. There's plenty more proof available, too—on the extra strength, digging ability and long life of Amsco Dippers. That's why they're the number one original-equipment choice on most leading makes of power shovels!

Consult your equipment manufacturer, or write us direct for new booklet on *Amsco Power Shovel Equipment*, giving detailed reasons why Amsco Dippers are real "beasts" when it comes to rugged digging work.

*Estimated

AMERICAN Brake Shoe COMPANY

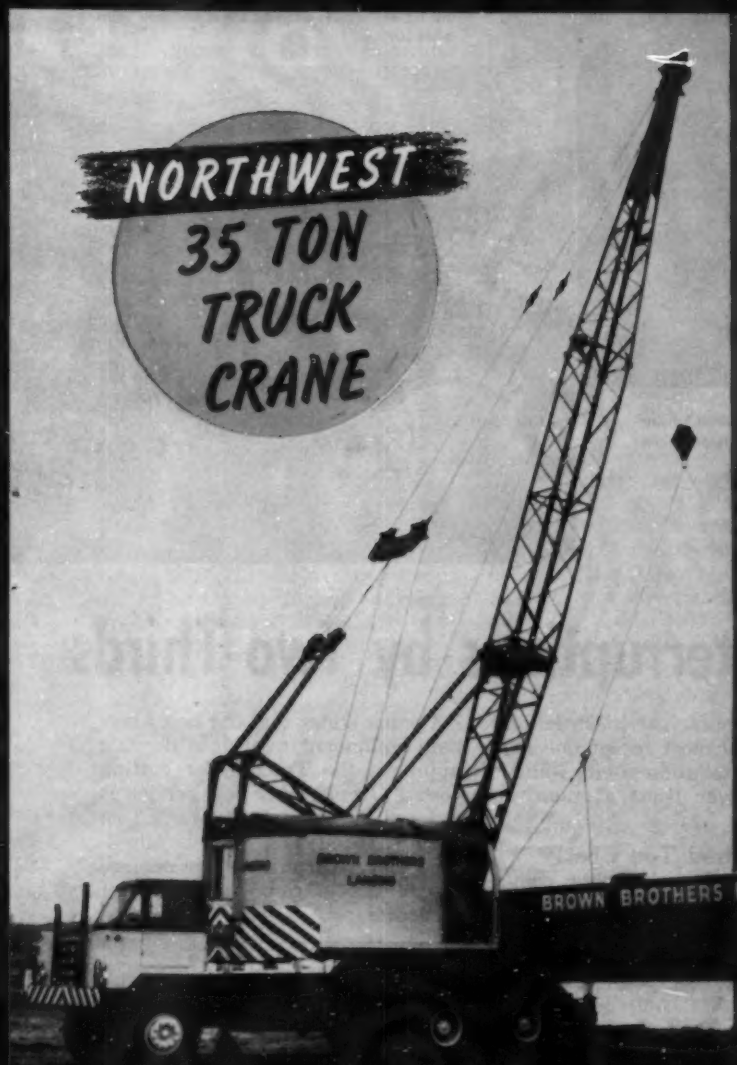
AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS; JOLIETTE, QUEBEC

. . . for more details circle 237 on enclosed return postal card

For those HEAVIER JOBS!



Have you seen the new Northwest 35-ton Truck Crane? The big 41 TC in the illustration is handling heavy barge sections for assembly on a bridge job in Holland, Michigan for Brown Bros., of Lansing. If you are considering high-capacity, rubber-tired crane equipment, you should see this Northwest before you buy.

It's smooth in operation. The Northwest Independent High Speed Boom Hoist gives you boom control the like of which you have never experienced before. It is power controlled both up and down and it operates independently of any other machine function without sacrificing either of the main hoist drums.

Removable counterweight makes the reduction of gross weight a matter of minutes and pivoted gantries are quickly raised and lowered under power for clearance.

The "Feather-Touch" Clutch Control assures ease of operation and gives the *feel of the load* without resorting to pumps, compressors, valves, tubing and other delicate mechanisms. Add to this a dozen other advantages that help you make money, many of them standard equipment. It is a high capacity, mobile package of lifting power.

And the carrier, remember, is Northwest designed – built to Northwest specifications for crane service and tested for 35 ton Crane capacity. It incorporates Northwest features found in no other carrier.

Here is a combination that gives you the best in mobility and crane ability. See it! Ask about it!

NORTHWEST ENGINEERING COMPANY
1 West Field Building, 135 South LaSalle St., Chicago 3, Ill.

BUILT IN TWO SIZES
25 TON AND 35 TON

THE GREATEST COMBINATION OF PROVED ADVANTAGES EVER BUILT INTO A SHOVEL, CRANE, DRAGLINE OR PULLSHOVEL

NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS • TRUCK CRANES

"We feel that the usage of the Tractairs is nothing short of essential in our type of operation," says Aaron J. Conner (left). Backfill tamping is only one of many jobs that can be done with the Le Roi tractor-compressor.

Hoist attached to front-end loader lifts pump assembly. The rubber-tired Tractair met contract stipulation of the Selma job that "there was to be no damage to existing street surfaces" during pipe-laying.

Tractair* Cuts Work Interruptions by Two-Thirds

Each Le Roi unit "saves at least $7.00 per day," general contractor reports.

Self-propelled tractor-compressor provides on-the-job air power without costly delays.

"Since the Tractairs enable us to eliminate work stoppages involved in moving the conventional wheeled, portable compressors from one working area to another on the same job site, we save at least a full day of labor at each construction location," reports Aaron J. Conner, general contractor of Roanoke, Va., who specializes in utility construction work. That's quite a saving when you consider that he employs 20 men, working 10-hour shifts.

He adds that the cost-cutting versatility of his three Le Roi tractor-compressors pays off on highly competitive municipal construction contracts. His most recent one involves the installation of city water, gas, and sewer lines at nearby Selma, Va.

Old Method Too Costly

Conner's work requires that compressors be moved as many as 10 times a day. With ordinary equipment, each move meant a work interruption of 30 minutes during which the entire compressor crew was idle. As a result, five man-hours were wasted during a normal day. In addition, each move tied up a truck and a moving crew, creating a secondary work stoppage.

"With the mobile Tractair equipment, it takes just one man to walk to the unit, move it directly to the next working area, and set up again, all within a ten-minute period," Conner reports. What's more, the truck and its crew are released for other duties.

Conner states that the best alternate equipment available doesn't approach the Tractair for cutting costs. "Overall labor cost per job is reduced by approximately 5%," he declares. And the Tractair simultaneously "permits us to achieve standards of efficiency we could not otherwise get."

Has Many Uses

Versatility is another Tractair advantage. For example, a hoist mounted on the unit's front-end loader reduced pipe-laying time by 20%. A scoop bucket adapts the tractor-compressor for stockpiling materials and for resurfacing ditch lines. Tractair also provides air power for drilling, tamping, and for air pressure-testing of natural-gas pipe lines.

So, if outmoded equipment is cutting too deeply into your profit, it's time to get a Le Roi Tractair. Write us today for details.

T-75

*"Tractair" is the registered trademark for Le Roi's combination tractor—air compressor.

. . . for more details circle 273 on enclosed return postal card

WABCO

LE ROI Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin, manufacturers of Newmatic air tools, Tractair,® portable and stationary air compressors, and heavy-duty industrial engines. Write us for information on any of these products.

DESIGN STANDARDS

(Continued from page 96)

right of way. Here is where the most mistakes are made. Most facilities do not have wide enough ways to take care of the inevitable need for future widening.

• The next most permanent feature is alignment. If we design this poorly so that the whole investment will have to be thrown away, the cost will be intolerable. The line must not be tortuous or accidents will tend to increase and traffic to slow down when volumes become high.

• Don't have horizontal or vertical curves too close together. Better design in this respect can add 10 percent to the traffic capacity of the road. Elimination of sharp curves will reduce superelevation, which is a cause of poor drainage and ice accumulations.

• Easy grades have a new economic importance. Most grade problems in the past have been worked out on a vehicle operating basis. Safety today needs greater consideration. Grades that are slightly too steep will retard trucks, engendering rear-end collisions which are one of the most important causes of accidents on divided highways.

• There are innumerable smaller yet important items in the designer's kit. Attention to all of them will help add up to a better job; a road will not require untimely reconstruction. For example:

Fixed objects must be eliminated in the design. Trees should be surrounded by thick protected cushions of shrubbery, planted in massed groups, since every tree is a target.

• Bridge piers and abutments need to be surrounded by guard rail, flared at the ends. Bridge rails and guard rails should be continuous without offsets. (Many roads today show lack of harmony between bridge designer and road designer in these respects.)

• Bridge sidewalks on small bridges need to be flared gently, and not ended abruptly for the same reason of safety in the event of emergency.

• Cross pipes and culverts must not be obstacles in case of emergency. Why the big concrete monuments for headwalls? Smaller pipes need no headwalls at all; mounded earth is better. Concrete headwalls when needed should be small and streamlined to deflect vehicles. Traffic engineers realize that vehicles *do* get off the roadway, and some designers in the drafting room have not fully realized the frequency with which they do, was the Commander's observation.

• Medians must be wider than in the past—the wider the better for safety. Every foot of additional width means fewer accidents involving vehicles crossing to the opposite roadway. Fixed median barriers are needed where the center strip is quite narrow. The exact point of demarcation is not clearly determined; possibly 30 ft.

Whether a median should be depressed or raised for maximum safety has not been settled. The raised design is better for medians less than 30 ft. Raised medians require different drainage, however. In any event the median should be so designed that the driver can "ride it out" in an emergency.

• Shoulders both inside and outside must be paved on heavily traveled highways. Highway engineers are constantly being surprised at the frequency of the use of shoulders. On the New Jersey Turnpike, for example, the cover stone was worn off in five or six days after opening the highway, despite signs which read "do not stop except for repairs." Shoulders must not force a sudden slow-down to a vehicle to get on them, or rear-end collisions may result.

• Sight distance requires revised thinking due to the lowering of the driver's eye in the new low-slung vehicles. The old 4.5 ft. standard for eye height is obsolete. The problem today tends toward vertical curves as long as one-half mile; drainage at times may have to be secured by warping.

Discussion of the Commander's remarks brought out a number of points. One speaker asked for opinions on the adoption of variable-width center islands for expressways, spreading out to 500 or 600 ft. between the two roadways. The speaker cited the Bureau of Public Roads and other agencies as advocating that each dual roadway be designed as an individual roadway, and where feasible the medians be varied. This is not an easy solution, he noted. Where tree growths in the island are left untouched, trees must be far enough back so that any trees blowing down in a storm will not cause a "fixed object" problem on the pavement. Trees in medians, again, must be cushioned by shrubbery. Also extremely wide medians cause an operating problem since highway patrolmen must at all times be able to see across to the opposite roadway, to detect violators or distressed vehicles.

As a final word of counsel, Commander Noble said "do not use the minimum" design as if it were *the* standard! There are cases where the minimum curve is thrown in repeatedly throughout an entire highway project, with no judgment shown. In such instances possibly money would have been saved actually by going to higher standards and using greater flexibility of thinking in the drafting room.

Goodyear to Build New Tire Proving Ground in Texas

A multi-million dollar tire test proving ground is to be built by The Goodyear Tire & Rubber Company at San Angelo, Texas. The facility, reported to be the largest of its kind in the rubber industry, will include a banked 5-mile high-speed circle, a meandering 20-mile paved figure-eight turnpike road, a 2½-mile tractor tire straightaway, a 5-mile wandering gravel road and headquarter buildings. The circle will accommodate speeds to 160 miles per hour.

The test site, a trapezoid in shape, covers 7,300 acres of rolling ranchland situated 14 miles northeast of San Angelo on the former Crownest Ranch. Construction will culminate five months of engineering study and three years of planning by Goodyear's tire development department.

Until the circle and buildings are ready for use, Goodyear will maintain its present tire testing operation in San Angelo. For the purpose, the company leases 20,000 square feet of floor space in several adjoining buildings within the city. The round-the-clock operation is managed by C. F. "Flete" Beckett. Wade Johnson, manager of tire testing, is in over-all charge of the operation.

● The 50 construction contract sections in progress on the Illinois toll highway, as of early October, totalled $264,417,600. These projects, which average over $5 million dollars each, include committments for all roadway and bridge construction and for the supply of all materials such as aggregates, fencing, guard rail, free cast concrete, etc.

Take a piston. Its place of business in a CAT* Diesel Engine is in the "heat zone"—up to 3600° F. Here's where some substitute pistons soften, crack and burn through. But not a genuine Caterpillar piston. Copper, nickel and magnesium are alloyed with aluminum to maintain hardness and strength under these high temperatures. Yet, the special aluminum alloy retains the high weight-to-strength ratio and heat conductivity of aluminum. With a substitute, can you be *sure*? Better see your Caterpillar Dealer for parts you can trust!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

. . . For more details circle 323 on enclosed return postal card

MR. CONTRACTOR

IN SPOTS LIKE THESE YOU NEED AN EIMCO EXCAVATOR

TIGHT QUARTERS

TUNNEL EXCAVATING

LOADING HEAVY ROCK

Illustrated are just three job conditions where 105 Eimco Excavators outperform other earthmovers. It takes care of the tough jobs just as efficiently as it does the easy ones.

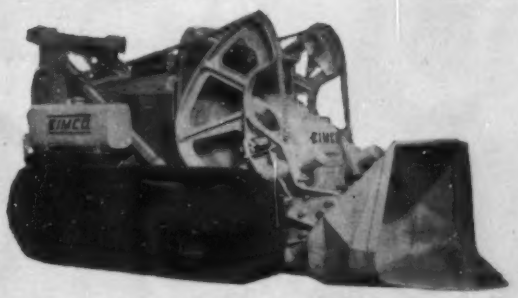
The knowledge and experience gained from building thousands of underground loaders was used to full advantage when we designed and engineered the Eimco Excavator. We gave it the same extra strength for severe service; increased the life and efficiency of working parts thru simplification; gave it I.T.R. (independent track reversal) mobility and "passenger car" power-shift operating ease. Then we put the operator up front where he can see what's going on.

Overhead discharge speeds cycle time; makes it possible to dig, load and dump from one position and do road-work without stopping highway traffic.

With powerful crowding action (39,000 lbs.) the Eimco 105 loads large rocks without secondary blasting usually required when boom shovels or other loaders are on the job.

The Eimco 105 Front-End Loader combines this same high tractor mobility with front end loading versatility for handling scores of different jobs economically.

Write for information on the Eimco 105 Tractor Excavator or Front-End Loader . . ideal highway building tools.



EIMCO 105 EXCAVATOR

THE EIMCO CORPORATION

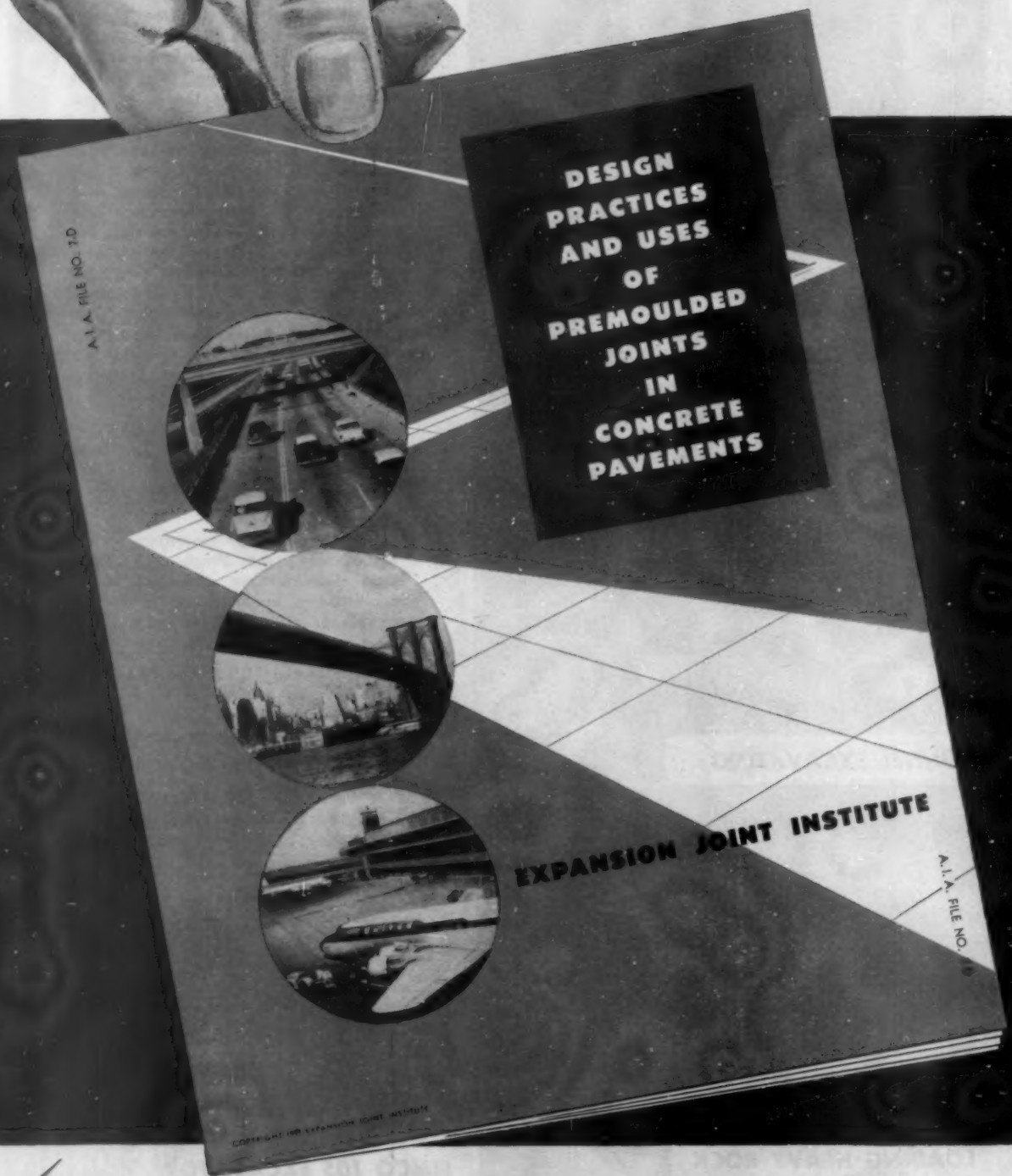
Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Pittsburgh, Pa. Seattle, Wash.
Cleveland, Ohio Houston, Tex. London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa

8-393

. . . for more details circle 256 on enclosed return postal card

...how to provide for


DESIGN PRACTICES AND USES OF PREMOULDED JOINTS IN CONCRETE PAVEMENTS
A.I.A. FILE NO. 7-D
EXPANSION JOINT INSTITUTE
A.I.A. FILE NO.

EXPANSION JOINT INSTITUTE

121 HILL AVENUE • AURORA, ILLINOIS

The Celotex Corporation
120 South LaSalle Street
Chicago 3, Illinois

W. R. Meadows, Inc.
2 Kimball Street
Elgin, Illinois

Presstite-Keystone
Engineering Products Co.
3782 Chouteau Avenue
St. Louis 10, Missouri

Servicised Products Corp.
6051 West 65th Street
Chicago 38, Illinois

expansion and contraction in concrete pavements

NEW "DESIGN PRACTICES" Manual now available at no charge!

As one of the first projects in a united effort to provide research, product development and technical data for the construction industry, the Expansion Joint Institute has produced a new manual entitled, "Design Practices and Uses of Premoulded Joints in Concrete Pavements." This manual, the first of its type, was produced in answer to the many requests for a manual on the types and uses of Premoulded Joints. "Design Practices and Uses of Premoulded Joints in Concrete Pavements" features comprehensive technical data and illustrations on the many types of premoulded joints, their applications and installation information. This manual will provide an excellent addition to your design file. To get your copy . . . just fill out the coupon below and mail today!

EXPANSION JOINT INSTITUTE

EXPANSION JOINT INSTITUTE
121 HILL AVENUE • AURORA, ILLINOIS
DEPT. 14

Gentlemen:

Please send me without obligation my free copy of "Design Practices."

NAME _____

FIRM _____

ADDRESS _____

CITY _____ STATE _____

. . . for more details circle 319 on enclosed return postal card

Is "No Steel" Prestressing Practical for Highway Paving?

No, says this analyst, who believes creep and shrinkage will result in serious loss of stress.

By letter to the Editor from H. Kent Preston, Engineer, Construction Materials Division, John A. Roebling's Sons Corporation.

IN THE AUGUST 1957 issue of *Roads and Streets* you invite comments on the article "Suggested Design for an Experimental Prestressed Concrete Pavement."

Analysis of this article indicates that the effect of creep and shrinkage in the concrete have been overlooked. As a result of these properties the prestress in the slab will be completely lost in less than a year after prestressing. Two recognized authorities in the United States have established specific values for these properties. "Criteria for Prestressed Concrete Bridges" by Bureau of Public Roads says on page 13:

"*Creep of Concrete:* This may be taken at 2.25 times the elastic compression."

"*Shrinkage of Concrete:* The shrinkage will be assumed as 0.0002 in. per inch—for post-tensioned structures it is assumed that one-half the shrinkage has occurred before prestressing is begun—"

This means we must allow for an effective shrinkage of 0.0001 in. per inch in addition to the creep.

The preliminary report of ACI-ASCE Joint Committee 323 "Recommended Practice for Prestressed Concrete" says:

"*Section 207.2.5—Creep of Concrete:* A *total* strain of three times the elastic shortening is suggested to take care of both creep and elastic shortening."

This means that the creep is 2.0 times the elastic shortening.

"*Section 207.2.4—Shrinkage of Concrete:*—0.002 in. per inch is commonly used for calculation of prestress losses. It is generally assumed that part of the shrinkage has occurred prior to post-tensioning—"

As indicated by the above criteria, the amount of creep per unit length is a function of the compressive stress due to prestress and the amount of shrinkage per unit length is a constant. During periods of average or higher than average temperature the unit prestress is relatively high and creep will progress rapidly. After a period of about six months at average temperature, the amount of creep will be so large that the prestress will drop to zero with a relatively small drop in temperature.

The loss due to shrinkage must also be considered. Assume the concrete has a modulus of elasticity = E = 4,000,000 psi; e = strain in inches per inch = 0.0001. Then

$$e = \frac{P}{A} \times \frac{1''}{4{,}000{,}000}$$

$$\frac{P}{A} = 4{,}000{,}000 \times 0.0001 = 400 \text{ psi}$$

Thus shrinkage creates a stress loss of 400 psi.

Two foreign airport runway slabs were built by this method about two years ago. Although they have given satisfactory service to date, it is doubtful if they would prove economical in the United States. Their original prestress was obtained by jacking in joints at 1,000-ft. intervals. In order to maintain a reasonable amount of prestress, each runway has been restressed twice at each joint and the details are such that additional restressing can be applied when needed.

Creep and shrinkage of concrete are not serious problems when the prestress is provided by high strength steel. The shortening due to these factors is small in comparison to the total stretch in the steel which means that only a small percentage of the total prestress is lost and this is anticipated and provided for in the design.

The article takes an extremely pessimistic view of the "in place cost" of prestressing steel. Several organizations have been considering the problem of prestressed concrete slabs on grade. In general their requirements fall within the following brackets:

Slab thickness = 5 to 6 in.
Final prestress after all losses = 200 to 300 psi

The most economical method of prestressing under consideration is the use of 7-wire uncoated stress-relieved prestressed concrete strands pre-tensioned and bonded. For this method the strands will be pre-tensioned between temporary abutments in lengths of 10,000 to 15,000 ft. The concrete slab will be poured with narrow joints at 500 to 1,000 ft. intervals. When the concrete has cured it is prestressed by cutting the strands between the abutments and the slab and in each joint.

Consider a typical example with a 5 in. thick slab, a final prestress of 250 psi, joints at 500-ft. intervals and a width of 12 ft. From the tests reported in the July, 1956, issue of the Journal of the American Concrete Institute, we can safely use a coefficient of friction of 0.75. Then the force necessary to overcome friction between the center and end of the 500-ft. long slab is:

$$F_F = \frac{5''}{12} \times 12' \times 150 \times 0.75 \times 250'$$
$$= 140{,}625 \text{ lb.}$$

Prestressing force required at center of length is:

$F = 5'' \times 12 \times 12 \times 250$ psi = 180,000 lb.
$F + F_F = 320{,}625$ lb.

Final force after losses due to creep and shrinkage delivered by one $\frac{7}{16}$-in. diameter 7-wire stress-relieved

prestressed concrete strand is 15,120 lb.

320,625 ÷ 15120 = 21.2—Say 22 strands

In a section one yard long there will be 22 × 3 = 66 ft. of strand. Since this section is 4 yd. wide it contains 4 sq. yd. and uses 66 ÷ 4 = 16.5 ft. of strand per square yd. The present price of this strand is $81.10 per thousand feet.

$$\frac{81.10}{1{,}000} \times 16.5 = \$1.34 \text{ per sq. yd.}$$

At casting yards the 7-wire strand can be placed and tensioned for one-half cent per fot. The cost for this operation in a paving job won't be more than double this or a total of $0.17 per sq. yd. for placing and tensioning.

No attempt will be made here to design an abutment but if based on the figures in the article being discussed it should not be more than $0.10 per sq. yd. because:

1. The first 2 to 3 mile section will require two abutments but each new section will require only one new abutment since they can be used in each direction.
2. The total force anchored by the abutment for a 12 ft. width is only 320,000 lb. compared to 2,300,000 lb. for a 12 ft. width of the one described in the article.

In summary the total cost per square yard for prestressing steel including placing, tensioning and abutments will be about $1.34 ÷ $0.17 + $0.10 = $1.61. This cost will be at least partially offset by the fact that the prestressed slab is only 5 in. thick as compared to the 8 in. normally used for highway slabs.

Mr. Coppage's Further Statement on Prestressed Pavement Proposal

CONCERNING the comments on the article "Suggested Design for an Experimental Prestressed Concrete Pavement" in the August issue of *Roads and Streets* to the effect that creep and shrinkage were overlooked, I would like to state that on the contrary these two items were given serious consideration, and while admittedly they may be bothersome, there are a number of ways of offsetting their effects. Consequently the adverse effect of creep and shrinkage should not be construed as invalidating the "jacks and abutment" type of prestressed design. The French were well aware of the possible effects of creep and shrinkage before they embarked on this type of experimentation.

Values for creep and shrinkage of concrete contained in design criteria for prestressed structures are likely to run much higher than would actually be experienced on a prestressed pavement because of a liberal factor of safety and a generally richer mix for this type of construction. Then too, such criteria envisage the concrete being subjected to prestress as early as possible after pouring. The French delayed prestressing their experimental pavements 3 months, thereby taking care of most of the shrinkage.

It was expected that the suggested experimental pavement would lose several hundred psi of its initial prestress in the first year after construction. Such loss might be compensated for in a number of ways such as:

(1) Increasing the initial prestress applied. This is the method used for prestressed structural members.

(2) Re-jacking after one year, by which time nearly all of the shrinkage and creep will have occurred. This would cost only $0.03 per sq. yd. See estimate of cost of prestressing, Table 1 of article page 86.

(3) Incorporation of pressure cells similar to the "flat-jacks" used by the French in the center of the 1,000-ft. sections to be held in reserve for restoration of any loss of prestress. It is believed that pressure cells can be made for a very moderate cost.

(4) Use lean-dry-compacted concrete which would virtually eliminate shrinkage and probably greatly reduce creep, and would at the same time save about $1.00 per cu. yd. of concrete in material cost.

(5) Use an admixture in the concrete that will expand the pavement an amount equal to the shrinkage and creep. There are commercial products presently available for accomplishing this.

(6) Re-working or "tempering" the concrete mix to eliminate shrinkage.

(7) Installation of permanent automatic pressure equalizing cells at intervals of 2,000 ft. to maintain relatively constant compressive stress in the pavement. This last method is probably the most expensive of the various solutions, but might still produce a pavement costing considerably less than one containing high-tensile strength steel.

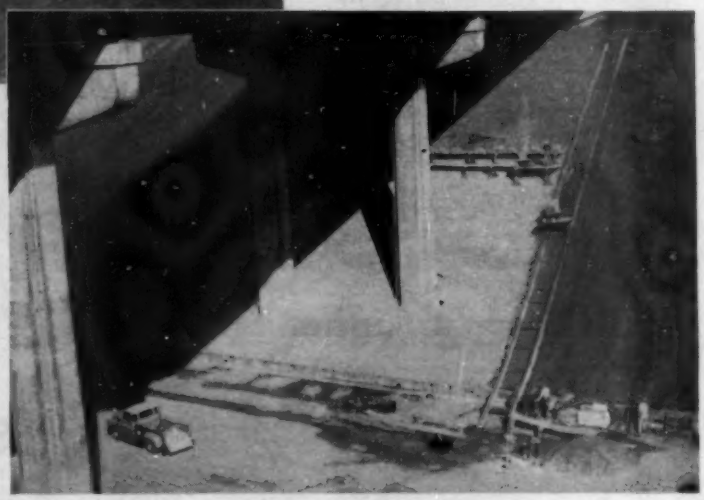
Regarding the "in-place cost" of $0.50 per lb. for prestressing steel, I felt that I was leaning over backwards to use such a low figure, since the U.S. average cost for prestressed highway bridges in the past year was approximately $1.00 per lb. for prestressing steel.

It would not be proper to make a price comparison between a 5-inch steel prestressed pavement and an 8-inch no-steel type. Therefore, if we take the reported $1.61 per sq. yd. cost of prestressing a 5-inch prestressed steel type pavement and convert this to an 8-inch design, we get roughly $2.50 per sq. yd. for prestressing. In contrast with this is the very low $0.25 per sq. yd. cost for prestressing and abutments for the proposed 8-inch no-steel design. Incidentally, the cost of joints for the steel prestressed pavement will add $0.25 to $0.50 per sq. yd. to the cost, giving an over-all price differential of over $2.50 per sq. yd. between the two different types of pavement. With such a large differential it should be very apparent that we can well afford to engage in research to solve the problem of shrinkage and creep in the proposed type pavement.

In the early development days of prestressed concrete structures, theories regarding creep created a "bogey" which probably frightened off many would-be researchers and developers in this country, with the result that utilization of this important design was seriously delayed. It is hoped that this "bogey" will not discourage prospective researchers from entering this much needed field of investigation relating to prestressed pavement design.

Edwin J. Coppage, Jr.
Highway Engineer
Wheaton, Maryland

● Concrete blocks, flushed with mortar after laying up, were used for bridge slope in Washington.



Concrete Blocks for Slope Paving Under Bridges

What is the most effective and economical type of pavement for wider-bridge slopes? Poured concrete, penetration macadam, stone riprap, all have been tried, and increasing use has been made of precast concrete blocks.

An example of the latter type is here pictured. The photographs show a slope job under the Captiol Blvd. bridge in Olympia, Washington. This job required 20,000 hollow 4 x 8 x 16 concrete units which were laid dry with the joints screeded full of mortar as the final step. The Washington state highway department is developing as a standard this slope treatment under bridges throughout the new highway system.

The concrete blocks were manufactured and supplied by Graystone of Olympia, the masonry contractor was Ted Baskett and the general contractor for the project was Erickson Paving Company.

With Bentley on Rugged Road Job Over Sand Mountain

Contractor Ed Bentley is using an all-International outfit for hauling and dozing on his rugged 8½ mile relocation project over Sand Mountain in Jackson County, Alabama. Equipment includes three International 65 Payhauler trucks, four TD-24's, a pair of TD-18 crawler tractors, and two 75 Payscraper rigs. The job entails 609,000 cu. yd. of excavation; 375,000 cu. yd. of it is rock. Cut slopes up to 115 ft. necessary. Also working here are two Galion motor graders (T-118 and T-500) and two Bucyrus-Erie shovels (54-B and a 22-B). Bentley's Payhaulers are moving 3,000 cu. yd. of rock, Payscrapers 4,000 cu. yd. of earth, per 10-hour day.

POWER STEERING
That Can Take It

For TRUCKS
That Can Take It

DART

EUCLID

MACK

OSHKOSH

WALTER

VICKERS® HYDRAULIC POWER STEERING

The hydraulic power steering systems used on trucks like these have to be able to take it because the vehicles are required to take it. They are built for the rough, tough jobs . . . and the hydraulics must match. Heaviest axle loads . . . off road operation . . . the most difficult steering conditions possible are easily mastered by the power, inherent high quality, dependability and tough durability of Vickers Hydraulic Power Steering Systems.

Steering is made "fingertouch" easy and safe. Road reaction can't reach the driver through the steering wheel. Obstructions can't cause swerving. Driving is not a wrestling match, so the driver gets more work done with less fatigue.

The superior design and rugged construction of the Vickers Hydraulic Power Steering Booster assure dependability, long life and low maintenance. Typical are the oversize piston rod and the extra large control valve.

The Vickers Vane Type Pump has hydraulic balance that eliminates pressure-induced bearing loads and assures long life with minimum maintenance . . . the key to less downtime. Correct running clearances (both radial and axial) are automatically maintained, providing high efficiency throughout pump life.

Get all the facts about the advantages of Vickers Hydraulic Power Steering. Ask for Bulletin M5101A.

VICKERS INCORPORATED
DIVISION OF SPERRY RAND CORPORATION
Mobile Hydraulics Division
ADMINISTRATIVE and ENGINEERING CENTER
Department 1432 • Detroit 32, Michigan

Application Engineering Offices: • ATLANTA • CHICAGO • CINCINNATI CLEVELAND • DETROIT • GRAND RAPIDS • HOUSTON • LOS ANGELES AREA (El Segundo) • MINNEAPOLIS • NEW YORK AREA (Summit, N.J.) • PITTSBURGH AREA (Mt. Lebanon) • PORTLAND, ORE. • ROCHESTER • SAN FRANCISCO AREA (Berkeley) • SEATTLE • ST. LOUIS • TULSA
IN CANADA: Vickers-Sperry of Canada, Ltd., Toronto and Montreal

7841

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

For more details circle 305 on enclosed return postal card

New Products —

Reader Service Numbers on Attached Postage-Paid Postal Card

New Front End Loader

The Thew Shovel Co., Lorain, Ohio, has announced the first model of its new line of rubber-tired front end loaders. The line has been named Moto-Loader and the first model is a 4-wheel drive, 1¾ yd. capacity unit designated Model ML-153. The bucket roll-back at carry position is 40 degrees and forward reach at 7 ft. dumping height is 40 in. Peak lift capacity is 11,000 lb. at 0 mph with a carrying capacity of 6000 lb. at 4 mph. The weight of the gasoline-powered unit is 18,900 lb.; 19,600 lb. with diesel power.

The new ML-153 utilizes an Allison "Torqmatic," 3-speed, power-shifted, full reversing transmission and integral torque converter with a 2.5 to 1 ratio. Top speed is 21.4 mph.

A new concept for travel direction selection and throttle control is claimed for the machine. Two adjacent foot pedals, one for forward travel and one for reverse, give the operator direction control with one foot, while the other is used for braking. This frees both hands for steering and hoist and bucket controls, giving the ML-153 ease of operation.

For more information circle 101 on Service Coupon Page 16 and mail now.

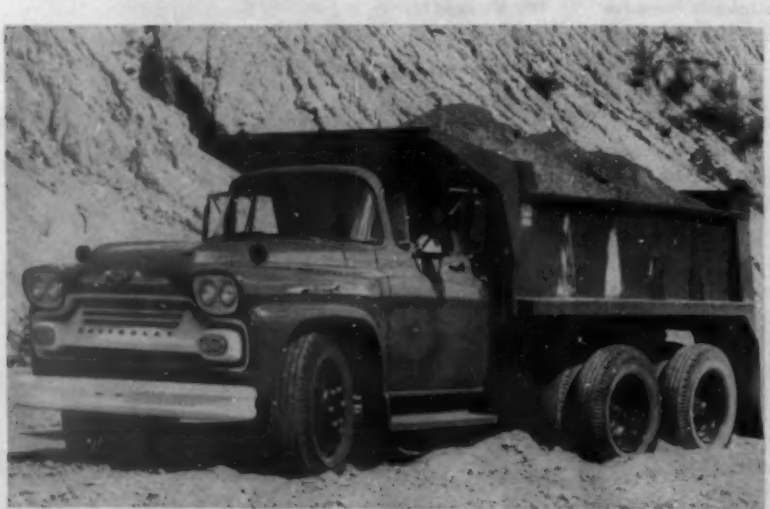
Thew Front End Loader

New 6, V8 Trucks

An expanded line of trucks featuring a new 348 cu. in. V8 of 230 hp, bany chassis improvements, and more powerful, sixes and V8's has been announced by Chevrolet Division, General Motors Corp., Detroit 2, Mich. The new truck line lists 12 new models for a total of 128, up 10 percent over the number available in 1957.

Of major interest is the addition to the line of nine new medium-duty cam-chassis models. Six, including three Low Cab Forwards, carry 72 in. cab-to-axle dimensions for more ideal weight distribution in trailer operations. Three new models have a 124 in. cab-to-axle dimensions to accommodate 16 to-19 ft. bodies. The 1958 truck line offers five basic engines.

For more information circle 102 on Service Coupon Page 16 and mail now.



Chevrolet Trucks

Grader Tire Is Wider

A new vibration-free road grader tire has been developed by the Firestone Tire and Rubber Co., 1200 Firestone Parkway, Akron 17, Ohio. Called the "Super Ground Grip Roadbuilder," the new tire is claimed to eliminate the troublesome wave motion which makes precision grading difficult. It has a wider, flatter tread and rugged traction bars to give positive gripping action on all types of surfaces. This open-center tread tire features better cleaning and smoother operation at all speeds, it is said.

An important feature of the new tire is its suitability for retreading due to its nylon cord body.

For more information circle 103 on Service Coupon Page 16 and mail now.

New Crawler Equipment

A new series of crawler equipment for shaft and tunnel excavation consisting of an overhead shovel loader, a bulldozer and a utility tractor has been announced

(Continued on page 115)

Postage Will Be Paid by Addressee

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY CARD

First Class Permit No. 52, Chicago, Ill.

3c Postage will be paid by

ROADS & STREETS
22 WEST MAPLE STREET
CHICAGO 10, ILLINOIS

Postage Will Be Paid by Addressee

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY CARD

First Class Permit No. 52, Chicago, Ill.

3c Postage will be paid by

ROADS & STREETS
22 WEST MAPLE STREET
CHICAGO 10, ILLINOIS

A special interview

ROADS & STREETS
22 West Maple Street
Chicago 10, Illinois

Please send me further information on products and materials mentioned in the Nov. Roads & Streets as circled below

CIRCLE THE NUMBERS AND MAIL NOW!

About New Equipment and Literature:

101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118
119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136
137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154
155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172
173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208
209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226
227	228	229	230	231	232												

Further Information on Advertised Products:

233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250
251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268
269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286
287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304
305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322
323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340
341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358
359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	

Name_____ Title_____

Firm or Gov't. Dept._____

Street_____

City_____ State_____ 11-57

NOT GOOD AFTER DECEMBER 15, 1957

ROADS & STREETS
22 West Maple Street
Chicago 10, Illinois

Please send me further information on products and materials mentioned in the Nov. Roads & Streets as circled below

CIRCLE THE NUMBERS AND MAIL NOW!

About New Equipment and Literature:

101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118
119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136
137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154
155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172
173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208
209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226
227	228	229	230	231	232												

Further Information on Advertised Products:

233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250
251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268
269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286
287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304
305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322
323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340
341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358
359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	

Name_____ Title_____

Firm or Gov't. Dept._____

Street_____

City_____ State_____ 11-57

NOT GOOD AFTER DECEMBER 15, 1957

A special interview

How ABRASIVE SAND problem was solved by rubber-tired tractor

Tournatractor's wide, low-pressure tires flex easily over sharp rocks without cutting . . . end age-old problem of rocks, sand, and dust clogging up track assembly.

You've probably seen the damage sand can do to your equipment . . . grinding away at exposed parts of earthmoving units. One machine — rubber-tired Tournatractor® — resists abrasion so well, however, that it's now the standard tractor in many sand areas. If, in your dirt-moving, your tractors frequently work in sand, or other abrasive materials, read what a sandpit superintendent — Ira Kent, Aubuchon Silica Mining Division of Portage-Manley Sand Co. at Festus, Mo. — has to say.

Q. *"Mr. Kent, why did you choose Tournatractor?"*

A. "There's a lot of sharp silica sand around here, and much of our work is on rocky surfaces. When we used crawlers, we had a major problem in track maintenance. Our sand in those tracks worked just like a grinding compound. We had continuous pad and roller trouble. So we bought a Model C-2 Tournatractor in 1950, and liked it so much we bought our present improved Tournatractor in '52."

Q. *"What sort of work does your Tournatractor do?"*

A. "We use it for just about everything. Its main jobs are stripping overburden and cleaning up around our shovels. It also builds and maintains haul roads, takes out trees, pulls heavy equipment, and does a lot of clean-up after blasting. Actually, we've found that we don't have *any* tractor jobs that our Tournatractor can't do."

Q. *". . . and what has the maintenance record been, Mr. Kent?"*

A. ***"Well, we've worked our Tournatractor 45 hours a week for almost 5 years, without any real trouble. Our one and only major repair expense in all that time has been replacement of the torque-converter oil-seal and bearings. We've never done anything to the engine . . . not even replacing an injector or anything. We never broke an axle, chipped a gear, or had a single major thing go wrong."***

Q. *"What about the electrical system and its maintenance?"*

A. "We like this electric control system . . . and it's never given us any trouble. In all this time, we have put in only one set of discs in the motor brakes, and two little switches. But that's it, so far as repairs are concerned."

Q. *"And the tires?"*

A. "Our present Tournatractor front tires are still the originals. We replaced the two back ones last spring, after better than 4 years of service. We've never had a blow-out, on any of the four. As to changing or repairing tires — you know that on Tournatractor, changing a tire is as easy as changing an 8.25 truck tire. That's another thing we like about this dozer. Lots easier than fixing track troubles."

One of many spare-time jobs handled by Tournatractor is building new haul road. Operator takes overburden dirt, drifts it on down to bottom, building up road grade.

Pit Mgr. Kent says: "Main reason we like our rubber-tired Tournatractor is its go-anywhere ability. It's quick on its feet . . . handles easier . . . maneuvers easier."

This owner-verified work report indicates how Tournatractor can solve your costly abrasion problem. Rolling on big rubber tires . . . with all parts sealed and protected against damage by rocks, sand, and other harmful materials . . . it gives you years of low-cost, trouble-free service. See your nearby LeTourneau-Westinghouse Distributor for full details and a working demonstration.

CT-1501-DC-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

. . . for more details circle 275 on enclosed return postal card

THE BUFFALO-SPRINGFIELD K-45 KOMPACTOR

How to select compaction equipment

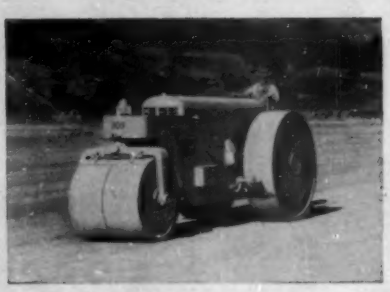
The logical question to ask yourself when you are ready to buy new compaction equipment is: "Exactly what do I need the equipment for and how will I use it?"

BASE FILL COMPACTION—This type of compaction demands equipment that will handle a wide variety of materials, give you the highest degree of compaction with the fewest passes. Buffalo-Springfield's revolutionary K-45 Kompactor is proving a real money-making answer for this type of work. It is self-propelled, relies on the "Interrupted Pressure Principle." All compaction effort is directed downward. Contractors testify they are meeting density requirements in one-fourth the time normally required with other compaction equipment.

FINE GRADE FINISHING — Buffalo-Springfield offers six 3-wheel rollers, ranging in capacity from 5 to 15 tons, to handle the large variety of materials found in fills, subgrades and unfinished bituminous pavements. The variable-weight 3-wheel roller is ruggedly built for years and years of hard, maintenance-free work.

Buffalo-Springfield's thoroughly-proved 3-axle tandem "walking beam" roller provides up to 60% greater tonnage compacted per day in superhighway construction, airport and military establishment jobs where specifications are extra strict.

ASPHALT FINISHING — Two-axle Tandem Rollers are designed especially for all surface finishing jobs. Ranging from 5 to 16 tons, Buffalo-Springfield Tandems are used for



3-WHEEL ROLLERS

heavy-duty highway and public works projects, and all types of finishing, maintenance and repair work. A wide selection of models for the biggest to the smallest jobs are designed for long-life and profitable operation.

TWO AXLE TANDEMS

SHORT ROLLING JOBS—Buffalo-Springfield's 3-5 ton portable roller is widely used for rolling driveways, sidewalks, parking and playground areas, and for patching and light finishing jobs. It is highly maneuverable and portable from job-to-job. Write today for full information on the type of equipment you need—or see your nearest distributor for an on-the-job demonstration.

3-5 TON PORTABLE TANDEM

THE BUFFALO-SPRINGFIELD KX-3 AXLE TANDEM

BUFFALO-SPRINGFIELD
Roller Division-Koehring Company
SPRINGFIELD, OHIO

. . . for more details circle 244 on enclosed return postal card

More New Products

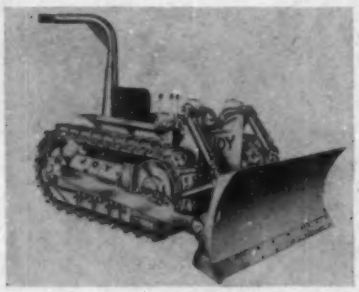
(Continued from page 112)

by the Joy Mfg. Co., Oliver Bldg., Pittsburgh 22, Pa.

Called the JSL-7 shovel loader, JMD-7 mining dozer and JMT-7 mining tractor, the machines come with either air or electric drive. With separate motors and independent track control for each track, one track can run forward and the other reverse to permit gradual or pivot turns or complete reversals within the machine radius. The equipment can be tailored for virtually any height requirements.

Joy claims that the shovel loader can load 2 to 4 tons per minute. Buckets ranging in size from 5 to 11½ cu. ft. are available. In tunnel construction, the JMD-7 dozer cleans up invert sections before concrete is placed.

For more information circle 104 on Service Coupon Page 16 and mail now.



Joy Crawler Equipment

Pickup Cab Carries Six

The Travelette, a custom styled International pickup truck with 6-passenger cab, has been introduced as a combination passenger-cargo carrier by the motor truck division of International Harvester Company, 180 N. Michigan Ave., Chicago 1, Ill. It is available on a 129-in. wheelbase chassis in the models A-110, A-112, A-120, A-122 and the four-wheel-drive model A-120 (4x4), and will handle up to full ton loads.

The cab has a full width rear seat accessible through a third, curb-side door. The 6-foot pickup body is 54½ in. wide, 49½ in. between wheelhousings. Ninety-inch load-carrying length is obtained from the front of the body to the rear of the lowered tailgate. The truck, also available with an 82½-in. service utility body, is offered in either custom or utility styling.

For more information circle 106 on Service Coupon Page 16 and mail now.

International Pickup

For more information circle 105 on Service Coupon Page 16 and mail now.

12-ton Transport Trailer

Adaptability to the purchase capacity of small contractors and other limited-budget equipment users receives foremost stress in a new 12-ton capacity unit by LaCrosse Trailer Corp. of LaCrosse, Wis. Designation, the "DFS-12". Designed for use behind standard fifth-wheel tractors, this trailer has an 8 ft. x 14 ft. oak deck platform, with 41 in. gooseneck and 2 ft, beavertail and comes equipped with four 825x15-14 Ply tires, ICC lights, lash rings, and 12¼ x 6 in. air or vacuum brakes, of the same S-cam design, with worm-type slack adjusters and removable brake spi-

LaCrosse Trailers

ders, as are use on standard heavy-duty LaCrosse trailers.

For more information circle 107 on Service Coupon Page 16 and mail now.

New Masonry Saw Line

A complete line of Select-A-Notch masonry saws, featuring an operation that lets one man perform all cutting functions from one spot in front, is being offered by Clipper Mfg. Co., Suite 250, 2800 Warwick, Kansas City 8, Mo.

These saws derive their name from the deep-seating notches that make it easy for one man to adjust the cutting head to the desired height for any size material. True cutting head alignment is guaranteed. Another feature is the pressure equalizer spring that is said to enable the blade to cut faster and last longer by automatically adjusting the blade pressure to the hardness of the material.

The entire line of Clipper saws is powered by specially designed G.E. motors that deliver more power with lower amperage demand.

Clipper Masonry Saw

For more information circle 108 on Service Coupon Page 16 and mail now.

Angular Torch Adaptor

A new angular machine-torch adapter now being marketed Air Reduction Sales Co., Division of Air Reduction Co., 150 E. 42nd St., New York 17, N. Y., is adjustable through a range of 250 deg. The cutting angle can be set without tools and without removing the accessory from the torch. Any required angle can be set between 0 deg. and 90 deg. either side of vertical, and within an additional 35 deg. above horizontal. Both sides of the body bear indexing marks in increments of 5 deg. The angular head accommodates standard Airco acetylene, propane and natural-gas tips, and is designed for service with the Airco Style 4700 machine cutting torch.

For more information circle 109 on Service Coupon Page 16 and mail now.

"Snap-On" Backhoe

New Hydraulic Backhoe

A hydraulic backhoe featuring quick attachment and detachment has been announced by Snap-On Digger Co., 1115 W. Fourth St., Winona, Minn. Called the Snap-On Digger and engineered to fit standard make tractors, the all hydraulic unit attach or detach is said to attach or detach in 30 seconds. One conveniently located release lever and a single break-away coupled hose are the only manipulation required to detach, leaving the unit standing on a tripod of the backhoe and the two hydraulic stabilizers. The manufacturer claims that the movement of a single lever and the recoupling of the hydraulic hose can also be done in less that half a minute.

Another feature is attachment or detachment of backhoe or shovel bucket in less than a minute without the use of any hand tools.

For more information circle 110 on Service Coupon Page 16 and mail now.

Heavy-Duty Concrete Saw

To meet the demands of contractors seeking a concrete saw small enough to be easily maneuverable yet powerful enough for heavy-duty work, Champion Mfg. Co., 2028 Washington Ave., St. Louis 3, Mo., says that their smallest saw, Model CS-500, is available with self-propulsion. The unit makes use of a re-rated Wisconsin TF engine, providing 18 hp. It is designed for sawing contraction joints, trenching, patching —almost any job generally done by heavier saws, it is said.

Champion Model CS-500 Concrete Saw

For more information circle 111 on Service Coupon Page 16 and mail now.

Deep Beam Guard Rail

Granco Steel Products Co., subsidiary of Granite City Steel Co., Granite City, Ill., has brought out a deep beam highway and bridge guard rail designed as a high strength visual barrier to protect bridge approaches and to safeguard highway traffic, particularly on curves and deep fills. Height of the new rail is stated to be such as to deflect cars parallel to the roadway, without danger of hurdling. Unique flared end sections help prevent cars from hitting the end of the rail head on. The rail is corrugated and designed for a 12 ft. 6 in. post spacing. For curves of less than 150 radius, it is bent in the shop before delivery. Twelve-gauge steel is used for regular highway guard and 10-gauge for bridge guard.

For more information circle 112 on Service Coupon Page 16 and mail now.

Motorola Remote Control Console

New 2—Way Radio Console

A remote control console, designed with application flexibility for obsolescence-free operation, is available from Motorola, Inc., 4501 W. Augusta Blvd., Chicago 51, Ill. The console extends the control function of any remotely located 2-way radio base station to the dispatcher's office over two or four wire lines. The all-metal housing has provisions for 13 controls on the front panel. These 13 positions may be utilized for one or more of the

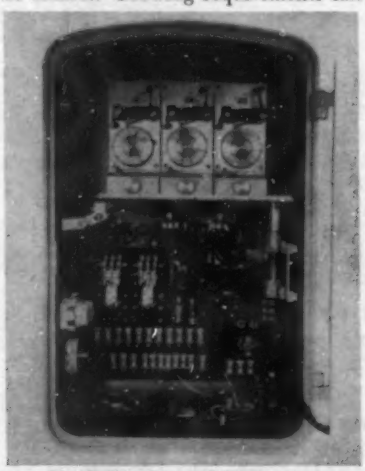
Ford Trucks

"kits" available to meet the needs of the radio dispatcher. As requirements change, new kits may be added to the Console to keep system operation up-to-date.

For more information circle 113 on Service Coupon Page 16 and mail now.

Traffic Signal Controller

A new multi-dial controller for traffic signals is in production at The Marbelite Company, Inc., 175 N. 10th St., Brooklyn, N.Y. Designated the M-30, the unit is designed for one, two, three or more dials as required, each with time cycles from 30 to 120 seconds. Eighteen signal circuits (more if needed) are available to take care of the complex requirements of modern traffic control. Growing requirements can



Marbelite Control Mechanism

be met without further major investments in equipment, states the manufacturer. Other features include automatic control of flashing, shutdown, remote control of emergency all-red, as well as manual operation when needed.

For more information circle 114 on Service Coupon Page 16 and mail now.

Trucks Have New Features

In announcing its truck series for 1958, Ford Motor Co., PO Box 638, Dearborn, Mich., stresses increased engine durability due to modification of crankshafts, pistons, valves and camshafts; improved performance under all operating conditions through a new carburetor; an increase in engine efficiency by the addition of a new water pump of higher capacity and velocity; added spark control, and other mechanical improvements, it is said.

New safety vision, dual headlights which are claimed to give more road illumination, are integrated in a crosshatch grille, giving the truck an uncluttered, functional appearance. The heavier series offers a selection of auxiliary fuel tanks, with submerged electrical fuel pumps for adequate fuel delivery to engine and for minimizing vapor lock.

For more information circle 115 on Service Coupon Page 16 and mail now.

Long-Burning Space Heater

The Champion Mfg. Co., 2028 Washington Ave., St. Louis 3, Mo., has entered the portable space heater field for the construction industry with the Champ-Heater 16. Manufactured in 120,000, 200,000 and 300,000 BTU sizes, the heater will be promoted on the strength of three exclusive features, it is said, besides its portability. These are: 16 hours burning capacity—no night attendant needed; Underwriter-approved Sunstrand motor and burner; and complete combustion for odorless, fumeless operation.

Champion Space Heater

For more information circle 116 on Service Coupon Page 16 and mail now.

Planetary Truck Axles

Four new two-speed planetary type rear axles for International A-184 and AC-1890 models and 190, 200 and 220 series trucks are announced by the motor truck division of International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill. Developed to meet needs expressed by users of heavy-duty trucks, the new axles are rated from 18,500 to 23,000 lb. carrying capacity, and differential assemblies with capacity to handle from 25,000 to 30,000 lb. GVW and from 50,000 to 65,000 lb. GCW.

For more information circle 117 on Service Coupon Page 16 and mail now.

High Capacity Gas Heater

A gas heater which delivers the large quantities of hot water required in paving, ready-mix concrete production, building and other operations has been put on the market by Hauck Mfg. Co., 124-136 10th St., Brooklyn 15, N.Y.

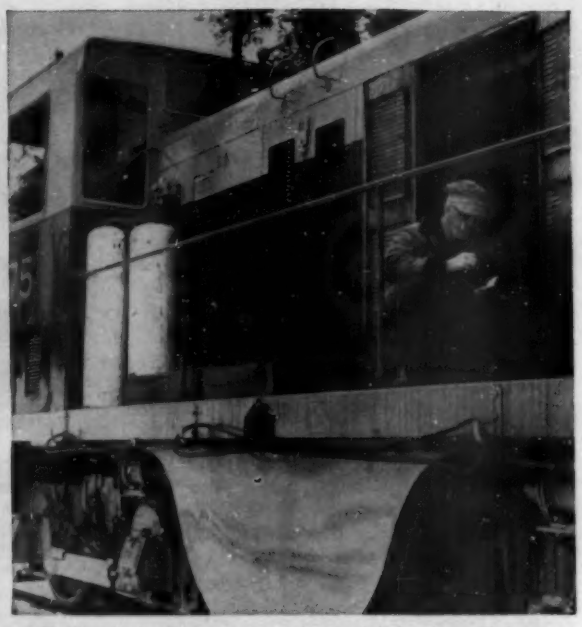
Hauck Water Heater

This water heater has conical steel coils of 1 in. seamless steel tubing and is fitted with recirculation to provide steady, uninterrupted supply of hot water to 190 degrees F. Model 301G, single coil type, heats 1250 gph with a 50 degree rise, or 450 gph with a 140 deg. rise. Model 312G, double coil type, heats 1660 gph with a 50 degree rise or 600 gph with a 140 degree rise from inlet temperature. Thermostatic control can be provided.

The burner utilizes L-P gas, propane or butane, and can be arranged also for natural, manufactured or mixed gas. Its design is said to assure high heat output and close flame control, with

(Continued on page 121)

A single drop of used oil from this truck indicates true condition of the vehicle's oil . . . and tells a lot about the engine's operation.



Daily oil checks assure maximum lubrication efficiency in this diesel locomotive.

Now—they're testing used oil in minutes

THE NEED for a fast, accurate and practical method for determining the condition of used oil has long been one of the more serious problems confronting fleet operators. It's obviously wasteful to discard still-good oil, but operating a vehicle with contaminated oil could lead to costly engine damage. This was an unsolvable condition which maintenance men had come to accept.

Since no two vehicles, even of the same make and model, are identical in performance or operation, maintenance men were compelled to compromise on oil change "averages" recommended by engine manufacturers. This procedure is uncertain and costly. Fortunately, this operating conflict has been resolved with the introduction of a simple but completely reliable oil check system . . . the Shell ADC Oilprint Analysis.

The ADC Analysis was primarily conceived to determine proper oil change intervals for individual engines. However, it goes much further. It is capable of actually reducing engine maintenance costs by disclosing certain mechanical defects *before* they have caused serious engine damage.

The test procedure is very simple . . . requires little practice to perfect . . . and provides a reliable check of oil from merely two drops of used oil. In minutes, the degree of *A*lkalinity, *D*ispersancy and *C*ontamination can be determined easily.

Here are several typical examples from various areas of the country. They show how fleet operators, employing both diesel and gasoline engines, have successfully and profitably applied the ADC program.

A Kansas City Freight Line

Operating a large fleet of trucks, one Kansas City freight line previously had drained and replaced oil every 3,000 miles. After adopting the ADC Oilprint Analysis, individual test charts showed that, in most cases, drainage would not be necessary at less than 6,000-mile intervals. Even at this doubled interval, engine life was not affected. Further proof was established when these engines were inspected at 87,000 miles and no appreciable wear was found on bearings, pistons, rings or valves.

An Idaho Logging Operation

Oil had previously been drained after a limited number of hours of use on an Idaho company's diesel locomo-

Substantial oil economy is realized in this tractor, because oil is changed only when indicated by the Oilprint.

Taking a quick "fingerprint" of crankcase oil from an interstate carrier.

tives. With the ADC Oilprint Analysis as a guide, the oil-change interval has now been safely increased many-fold. The savings made possible by this on-the-spot test in oil, filter change and labor costs were considerable. Furthermore, leaky head gaskets are frequently discovered before any serious engine trouble develops. Here is another valuable plus for the ADC Oilprint Analysis.

A Washington, D.C., Transit Company

This transit company operates a large fleet of buses with both gasoline and diesel engines in use. With the difference in operating schedules . . . rush hours, short and long hauls, around-the-clock schedules . . . both engine types were believed to require complete oil changes every 2,000 miles. When the ADC program was instituted, the tests showed that oil-drain periods and minor maintenance checks could be safely extended to every 3,000 miles for gasoline engines and 4,000 miles for diesel engines.

Fleet operators, who are concerned with extending the service of crankcase oil and avoiding the risk of using contaminated oil, are invited to sit in while a Shell service engineer demonstrates the time-and-money advantages of an ADC Oilprint Analysis program.

Photo shows an oil-spot test card . . . one phase in the visual life record of a change of oil.

One drop of a special indicator* fluid developed by Shell checks the alkaline reserve in the oil.

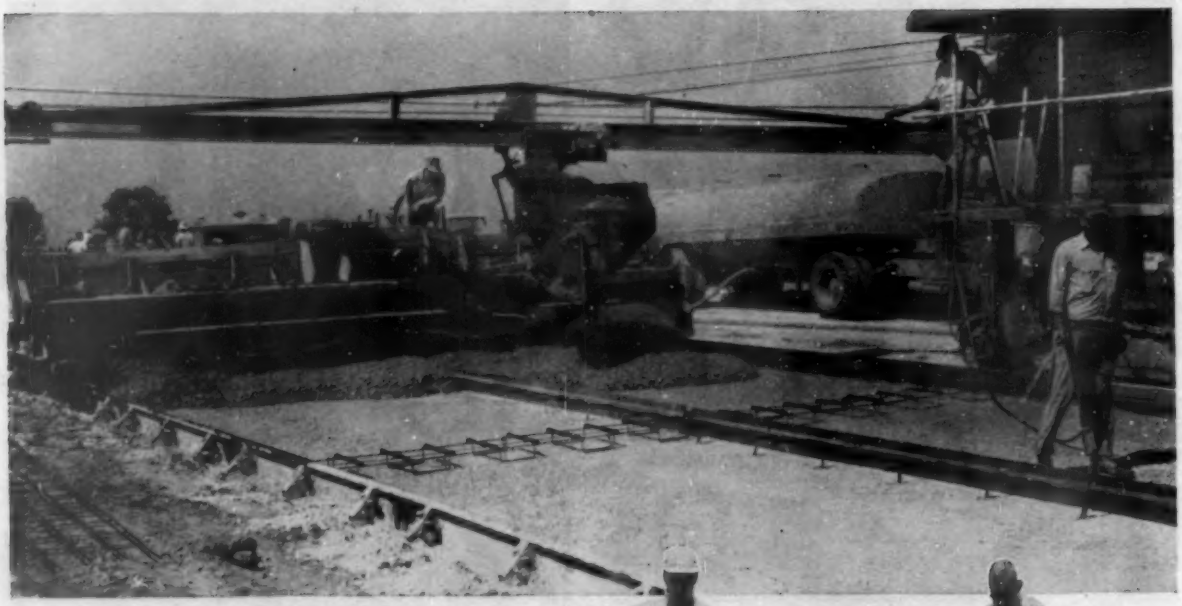
*Indicator Fluid U.S. Patent No. 2,770,530

SHELL OIL COMPANY

50 WEST 50TH STREET, NEW YORK 20, NEW YORK
100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

SHELL

. . . for more details circle 292 on enclosed return postal card



LACLEDE pre-assembled dowel units

Save Field Labor...

Speed Highway and Airport Construction

All parts of Laclede dowel assemblies for expansion, contraction and construction joints (expansion sleeves, chairs, spacing devices) are precision-welded into one unit at the plant before delivery to the job. This pre-assembly insures an accurate easily handled one piece unit permitting fast installation with reduced field labor costs. The dowels are maintained in rigid alignment. Where specified, the units may be furnished painted or coated, eliminating a time consuming and costly job operation.

OTHER LACLEDE HIGHWAY STEELS:

- Multi-rib round reinforcing bars
- Center joints
- Tie bars
- Accessories

LACLEDE®

LACLEDE STEEL COMPANY

SAINT LOUIS, MISSOURI ◆ Producers of Steel for Industry and Construction

. . . for more details circle 272 on enclosed return postal card

New Products

(Continued from page 117)

instant turndown for small hot water supply requirements by the turn of a single valve, without removing the burner.

For more information circle 118 on Service Coupon Page 16 and mail now.

Spherical Bearings

The Cor series of corrosion-resistant spherical bearings, with the trade name "Spherco," is announced by Sealmaster Bearing Division, Stephens-Adamson Mfg. Co., Ridgeway Ave., Aurora, Ill. These units carry a heat-treated stainless steel, hardened and hard chrome-plated ball. Even stock sizes with static load capacities from 4,800 to 93,500 lb. are offered.

"Spherco" Bearing

For more information circle 119 on Service Coupon Page 16 and mail now.

Heaters For Tractor Cabs

New type hot water heaters for three models of Cat tractors have been announced by Caterpillar Tractor Co., Peoria, Ill. The heaters may be used with Caterpillar Dg, D8 and D4 tractors equipped with cabs and are available in two types, recirculatory and fresh air. Use of the latter system reduces the possibility of condensation on windows and the need for defrosters, as well as providing a constant supply of fresh air for operator comfort. The new heaters replace the recirculating type heater formerly available for these tractor models. Both heaters are available either factory-installed on new machines or for installation on machines already in operation.

For more information circle 120 on Service Coupon Page 16 and mail now.

1958 Line of Tractors

Tractors said to be the most powerful ever built by Ford Motor Co. are included in its new line introduced Nov. 15. A Powermaster class which includes six models has a 10 percent boost in horsepower over the largest tractor previously made by Ford. The engine now produces 44 drawbar horsepower. The Workmaster line of tractors, also comprising six models, has an engine developing 8 percent greater power than its previous counterpart. The engine is now rated at 32 drawbar horsepower. Torque of the new engines has been increased proportionately to provide sufficient lugging power to "pull through" under conditions where stalling might normally be expected. Compression ratios of both engines have been raised to 7.5 to 1.

Ford Tractor

For more information circle 121 on Service Coupon Page 16 and mail now.

Wrench for Frozen Drills

The wrench here pictured is designed on a double-surface locking principle which makes possible the release of a stuck drill steel by a pull and a twist at the same time. It is adapted for use with 7/8-in. hexagonal steels. Atlas Copco Eastern, Inc., Paterson, N. J., is maker.

Atlas Copco Pull Wrench

For more information circle 122 on Service Coupon Page 16 and mail now.

Tester for Concrete Slump

Soiltest Ball Penetration Apparatus

The Ball Penetration Apparatus, a new instrument for determining the consistency of fresh concrete, is available for Soiltest, Inc. 4711 W. North Ave., Chicago, Ill.

The apparatus is made in accordance with ASTN specification C-360, Ball Penetration in Fresh Portland Cement Concrete. It consists of a cylinder with ball shaped bottom and a handle weighing 30 lbs. A lightweight metal frame guides the handle and serves as a reference for measuring the depth of penetration of the ball.

Fresh concrete may be tested either as placed in forms or in a suitable container. No experience is necessary to operate the instrument. Twice the ball reading is approximately equal to the slump of concrete.

For more information circle 123 on Service Coupon Page 16 and mail now.

New Backhoe For Tractor

A new backhoe for mounting on International Harvester 300-350 utility tractors has been announced by Wain-Roy Corp., Hubbardston, Mass. A digging range of 190 degrees, a digging depth of 12 ft. below grade, and a loading height of 9 ft. are stated to permit the Model WR-350 backhoe to operate under cramped conditions and to handle a variety of trenching jobs, bell holes and foundation excavations, utility trenches, service lines, etc. A unique link-lever swing system provides smoothly cushioned swing.

The hoe is a self-contained unit and can be quickly attached or detached with 4-pin mounting, 2 hose connections.

For more information circle 124 on Service Coupon Page 16 and mail now.

Snow Blower Tractor Shovel

Clark Equipment Co's Construction Machinery Division, Benton Harbor, Mich., announces a snow blower for "Michigan" models 75A, 125A and 175A tractor shovels. Made by Krause Industries, Baraboo, Wis., the "Sno-Thro" Blower is mounted on the same pins as the standard bucket and can be hooked up or detached in minutes. It is stated that the unit works in heavy wet snow as well as in dry snow and that heavy windrowed snow can be loaded into trucks at a rate of 12 cu. yds. per minute.

The "Sno-Thro" is not dependent upon high horsepower, since its large

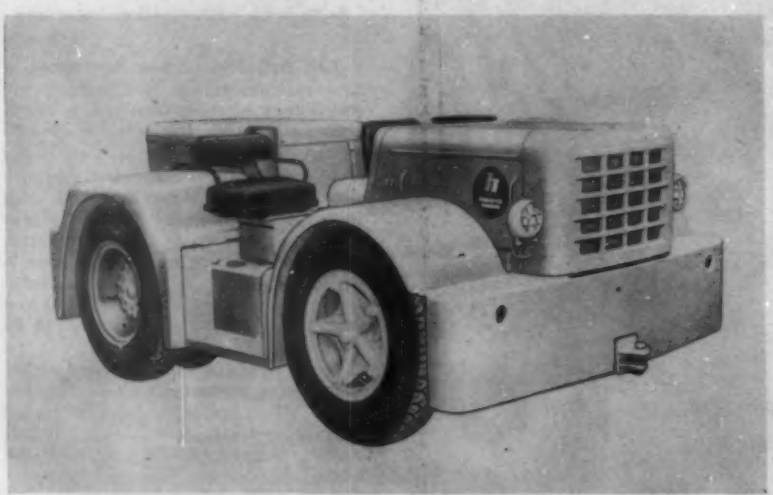
"Sno Thro" Blower

rotor travels at a low rpm and throws the snow. Clean loading results because it is not necessary to break the snow into fine particles, nor to create a turbulence.

For more information circle 125 on Service Coupon Page 16 and mail now.

Tractor Draws 15,000 lb.

Model T-150 "Paymover" tractor currently announced by the Frank C. Hough Co., 768 Seventh Ave., Libertyville, Ill., develops 15,000 lb. of drawbar effort and features power steering, four-wheel-power brakes, power shifter transmission, dual rear tires, planetary-type final drives and a choice of gasoline or LPG power. It has travel speeds up to 22 mph. It is said to be highly maneuverable and especially suited for the movement of aircraft weighing up to 250,000 lb. as well as industrial, rail and motor truck terminals and other tractor or applications. A variety of accessory equipment and attachments are available, including 2-way radio, aircraft engine starting systems, cabs, snow-plows and sweepers.



Hough "Paymover"

Installed LPG Engines

Availability of factory-installed LPG engines in cab-forward model trucks has been announced by the Motor Truck division of International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

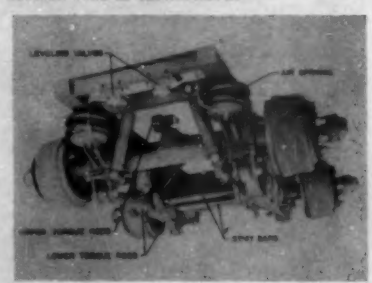
Factory-installed LPG power is also offered in the International model A-100, pickup, lightest truck in the line, making this fuel system available in models through the 4,200 to 60,000 lb. range in the International truck line.

Four International LPG engines were announced as available optionally in four and six-wheel A-line conventional and cab-forward models. These are the 132 hp Black Diamond 240, the 143 hp BD-264, the 138 hp BD-282, and the 155 hp BD-308.

For more information circle 126 on Service Coupon Page 16 and mail now.

Air Suspension System

The Clark Equipment Company, automotive division, Buchanan, Mich., has introduced a semi-trailer air suspension system featuring integrated air reservoirs and new sway control designs. Units are available in single axle models from 32,000 to 36,000 lb. Each is offered in packaged assemblies of frame, air springs, reservoirs, shock absorbers, filters, leveling valves and sway bars for simple installation on new equipment or operating trailers. Interchangeability of parts between single and tandem models is provided to facilitate fleet maintenance. Clark engineers state that trailer beds remain level both laterally and vertically under all load conditions and that lateral roll is minimized.



Clark Air Suspension System

For more information circle 127 on Service Coupon Page 16 and mail now.

Smaller Fork Trucks

Yale Materials Division, The Yale & Towne Manufacturing Co., Philadelphia, Pa., has extended its K-48 line of medium capacity, electric powered metal-handling trucks to include smaller models of 15,000 an 18,000 lb. capacities. Introduced last year in capacities from 18,000 to 30,000 lb., the lower limit of the line was extended primarily to meet increasing needs for lightweight coil handling in the non-ferrous metals industry. The new lower capacity models measure 124 in. from rear of counterweight to the face of the fork carriage and 61 in. in width. The

15,000 and 16,000 lb.) models provide dual operating stations for greater visibility as a standard feature.

For more information circle 128 on Service Coupon Page 16 and mail now.

Stabilizer Arm for Spreader

Baughman Spreader

Baughman Manufacturing Co., Inc., Jerseyville, Ill., announces a new stabilizer arm as standard on its lines of mechanical drive, chemical and abrasive spreaders. The device is attached by simple pressure and locked in place without keys, pins or use of tools, all in a matter of seconds, it is stated.

For more information circle 129 on Service Coupon Page 16 and mail now.

75hp Diesel Tractor

A new diesel tractor, the OC-15, has been announced by The Oliver Corp., 400 W. Madison St., Chicago 6, Ill. It has a high-torque, 6-cylinder diesel of 529-cu.-in. displacement, delivering 75 drawbar hp. It has 4 forward gear speeds ranging from 1.67 to 5.60 mph. For rapid maneuverability, there are reverse gear speeds of 1.99 and 4.48 mph. Controls have grouped design for simplicity and ease of operation.

Among the features of the OC-15 is Oliver's controlled differential steering, which provides full power on *both* tracks at all times. Operating weight is approximately 16,960 lb. Overall length is 128 in. Track frame is one piece and extra heavy. There are six lower and two upper track wheels and standard 16 in. track shoes, a total ground contact area of 2808 sq. in. The tractor is available with a choice of working attachments.

Oliver OC-15 Diesel Tractor

For more information circle 130 on Service Coupon Page 16 and mail now.

1-2 in. Cement Gun Hose

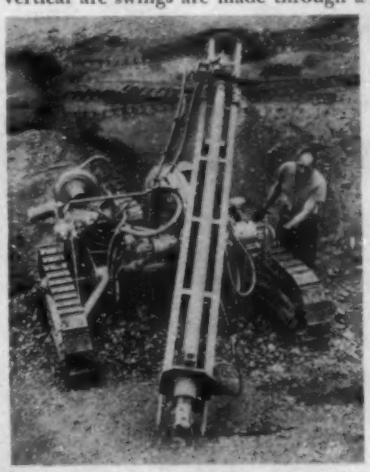
A new line of hose for handling sand and cement mixtures is announced by Acme Manufacturing Co. Div. of Acme-Hamilton Manufacturing Corp., 150 Meade St., Trenton 3, N. J.

It is made with a ¼ in. thick pure gum tube, a carcass consisting of plies of wrapped duck, and a friction fabric cover and is available with either a static wire or a static conducting tube to handle changes generated by guniting applications. It is adaptable for use with either wet or dry cement and for working pressures from 100 to 150 psi. Four sizes, ranging from 1 in. to 2 in., are made.

For more information circle 131 on Service Coupon Page 16 and mail now.

New Blast Hole Drill

Reich Brothers Manufacturing Co., Terre Haute, Ind., announces the "150 Blast Hole Driller" for use under ordinary conditions or at extraordinary angles. Size of hole, 4 in. Holes as high up as 7 ft. or as close as 9 in. to the ground are stated as within the range of the machine. Horizontal and vertical arc swings are made through a



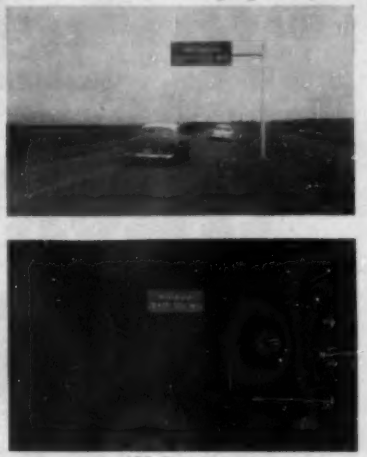
Reich Driller

full 150 degrees. Supporting the drill at the drive end is a standard hollow shaft cone-drive speed reducer (produced by Cone-Drive Gears of Detroit) which also drives the drill from a hydraulic motor. Hammering is by compressed air. The driller is self-propelled on its own standard crawler tracks.

For more information circle 132 on Service Coupon Page 16 and mail now.

Reflective Signal Letters

New reflective letters said to be 500 times brighter than white paint for traffic signs requiring extra brilliance, even in semi-lighted areas, have been announced by Dept. R7-321, Minnesota Mining and Manufacturing Co., 900 Bush St., St. Paul 6, Minn. Developed for changeable copy signs with reflective backgrounds, 3M Signal letters include numerals, arrows, borders, periods, hyphens and diagonals for fractions. They are made of a "Scotchlite" brand reflective sheeting, specially de-



3M Letters

veloped for the letters, which is covered with a rigid, transparent plastic sheet and backed with a flexible plastic film. Letter sizes range from 8 to 24 in. high. The letters have an opaque edge around the reflective surface to provide sharper definition both day and night.

For more information circle 133 on Service Coupon Page 16 and mail now.

160 KW Electric Set

A new electric set has been introduced, by the Caterpillar Tractor Co., Peoria, Ill. It is designated the "Cat D 375 Spark Ignition Electric Set." Available with either the new self regulated constant voltage Cat generator or an optional two-bearing generator, the new electric set is rated at 160 KW Power for the set and is provided by a V-type, D375 diesel engine equipped with simple alterations for fuel carburetion and magneto ignition system, allowing the set to operate on methane, butane, propane or field gases.

The unit is available with either of two engine compression rations—10:1 for use with methane gases, or 7.5:1 for butane, propane or field gases. It also may be converted for diesel operation. Compactness of the unit is provided by use of a top mounted exciter and a single, heavy-duty bearing on the new Cat SRCV generator.

For more information circle 134 on Service Coupon Page 16 and mail now.

New Tubeless Winter Tire

Designed specifically for use on new cars with 14 in. wheels, the new tire is stated to have a deep, self-cleaning tread that provides increased traction and skid resistance in deep snow or mud, the added traction being obtained through thousands of gripping edges put into the tread with a special machine after the tire is cured.

A newly-designed tubeless winter traction tire with an extra thick, wide tread has been announced by B. F. Goodrich Tire Company, Akron, Ohio.

(Continued on page 127)

we asked truckers what they wanted...

and here's what they got in the Reo Gold Comet V-8!

An all truck built V-8 engine that's up to 45% more efficient than engines of comparable and even greater displacement. With its "wet-sleeve" construction it's the only V-8 engine of its kind for unlimited engine life. Replaceable cylinders make any number of overhauls practical . . . cutting downtime and maintenance costs in half. A good thing to remember in selecting the "Big V" that's truly designed throughout—not "warmed over" and "beefed up"—to handle today's bigger trucking burdens.

build an all-truck engine!

Reo's Gold Comet V-8 is 100% truck built to begin with—not "beefed up"—right down to its tough special alloy steel cylinder walls. No passenger car components used.

double the engine life!

Reo's exclusive dual oil filters help do just that. By-pass and full-filtering reduce wear and friction as does many of its other exclusive features such as Reo's oil temperature stabilizer, hi-velocity cooling, sodium-filled valves and crankcase ventilating system.

REO DIVISION LANSING 20, MICHIGAN
THE WHITE MOTOR COMPANY

REO

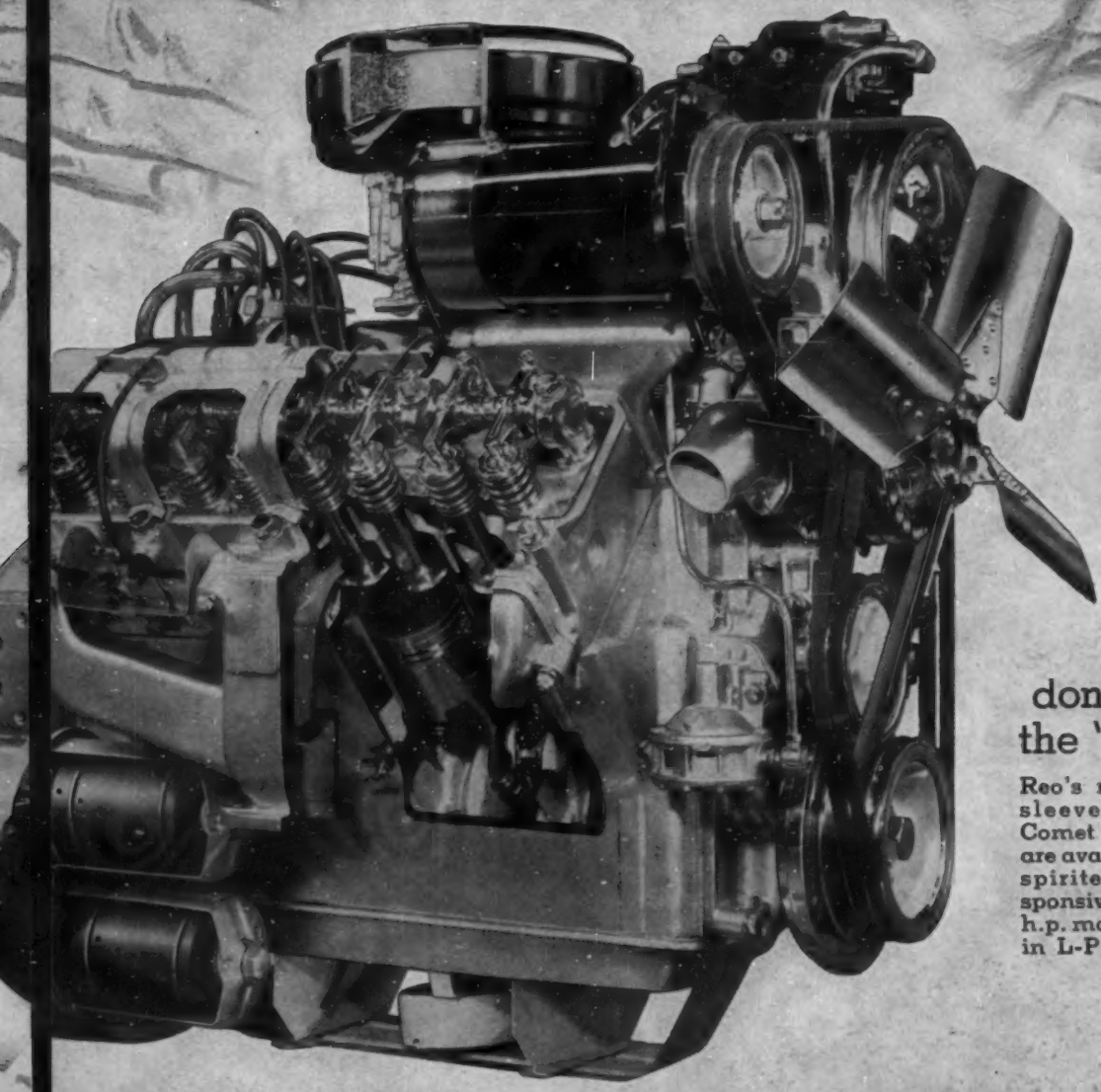
give us a choice of fuels!

And Reo does that today in either gasoline or liquid propane engines. Each completely engineered to the requirements of the specific fuel.

we want more power . . . but more efficient, too!

Reo's Gold Comet V-8 power adds up to more road power at the wheels where it pays off. Up to 45% more efficient than engines of comparable and even greater displacement . . . and at governed engine speeds.*

*Ask us to prove it!



don't spare the "horses"!

Reo's modern "wet-sleeve" V-8 Gold Comet truck engines are available today in spirited, super responsive 207 and 235 h.p. models—(220 h.p. in L-P Gas Models).

let's have longer life with less maintenance!

Reo engines have unlimited working life. Their "wet-sleeves" make any number of overhauls practical, eliminate re-boring and *refitting* and cut downtime and maintenance costs in half.

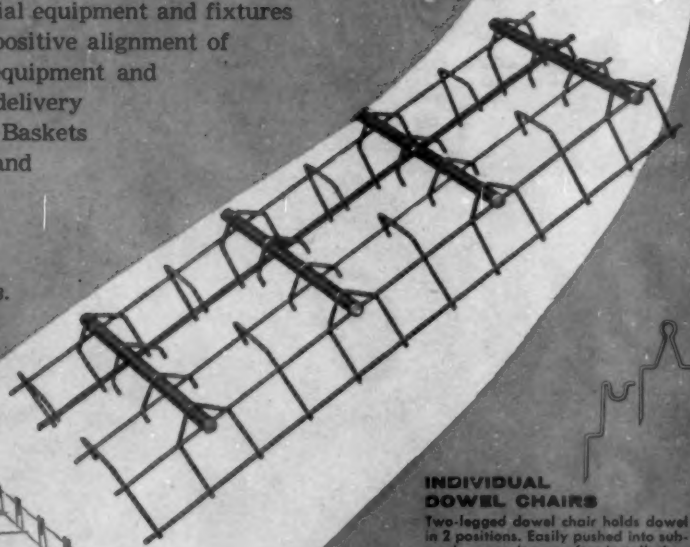
UNIVERSAL PRODUCTS
for highway construction

DOWEL BASKET ASSEMBLIES

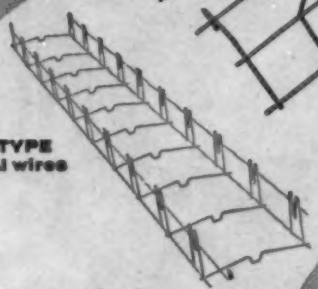
Universal Dowel Basket Assemblies are designed and fabricated to specifications. Special equipment and fixtures guarantee accurate spacing and positive alignment of dowels. High speed production equipment and modern facilities insure prompt delivery of your requirements. Universal Baskets are approved by Federal, State and private authorities for highway and airport construction.

Let us quote on your requirements. Write for complete details today.

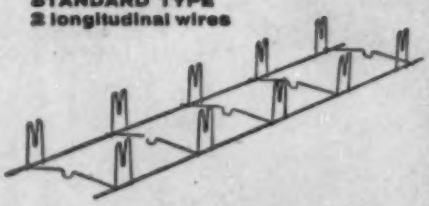
HEAVY DUTY TYPE
Maximum strength and support



STANDARD TYPE
4 longitudinal wires



STANDARD TYPE
2 longitudinal wires



INDIVIDUAL DOWEL CHAIRS

Two-legged dowel chair holds dowel in 2 positions. Easily pushed into sub-grade — won't turn after installation. Wide range of heights.

Single Leg Dowel Chair permits quick snap-in of Dowel. Sizes to support Dowel from 3" to 6" above sub-grade.

STAKE PINS

Keep Dowel Bar Assemblies in place during the pour. Lengths from 4" to 15" in ¼" increments.

DOWEL SLEEVES

Metal Dowel Sleeves for covering ¾" Dowel Bars; overall length covers 2½" or 3" Dowel. Special sizes and lengths available.

HOOK BOLT ASSEMBLY

For providing required tieing element along longitudinal joint. Eliminates necessity of bending tie bars or drilling road forms.

R 1801 **UNIVERSAL FORM CLAMP CO.**

GENERAL OFFICES AND FACTORY: 1238 N. KOSTNER • CHICAGO 51, ILLINOIS

OFFICES AND WAREHOUSES:

CLEVELAND, OHIO, 24901 Lakeland Blvd.
HOUSTON, TEXAS, 2314 Preston Ave.
LOS ANGELES, CALIF., 13210 So. Figueroa Ave.
BALTIMORE, MD., 1020 N. Kresson St.
SAN LEANDRO, CALIF., 2051-9 Williams St.
ATLANTA, GA., 1401 Howell Mill Rd.

DISTRIBUTORS IN PRINCIPAL CITIES

Service Wherever You Build . . . Coast to Coast

. . . for more details circle 304 on enclosed return postal card

New Products

(Continued from page 123)

Goodrich "Trailmaker" Tire

For more details circle 135 on Enclosed Return Postal Card.

Squarehead Power Cylinders

A new line of squarehead hydraulic power cylinders has been announced by Anker-Holth Division of The Wellman Engineering Co., a unit of McDowell Company Inc., Cleveland. The cylinders are double acting and are made for service at 2000 psi or 3000 psi in non-shock installations. All cylinders are tested out at 4500 psi before delivery. They are made to JIC standards. Bores are from 1½ in. through 12 in.

For more details circle 136 on Enclosed Return Postal Card.

Bottom Dump Trailer

A new bottom dump trailer is announced by Athey Products Corporation, 5631 W. 65th St., Chicago 38, Ill. Called the PW20, this 40- ton capacity trailer is made of "T-1" steel, a new high-strength alloy developed by United States Steel Corp., said to greatly reduce dead weight and correspondingly increases trailer capacity. (The rating is 80,000 lbs.—almost four times the trailer weight.) An exclusive feature is a rear door which opens simultaneously with the bottom door to give a smooth flow of material out at the rear.

For more details circle 137 on Enclosed Return Postal Card.

Ice Melting Compound

A snow and ice melting compound known as "Melt" is being introduced by Chemical Industrial Co., 3784 Ridge Road, Brooklyn 9, Ohio. The claim: very high thawing power; high activity at low temperatures; harmless to vegetation, rubber, and asphalt; contains a phosphate-type rust inhibitor to protect metals.

For more details circle 138 on Enclosed Return Postal Card.

Adaptable Car Unloader

A car unloader rated to handle up to 185 tons per hour of gravel, stone, sand or other bulk materials is the model No. 109 of The Fairfield Engineering Co. of Marion, Ohio. Overall dimensions are 20 ft. 10½ in. by 33¾ in. The belt is 24-in. wide. Power may be either 5 hp electric motor or 11 hp gasoline engine. The unit is adapted for service as an "over-the-rail" type unloader or in a standard pit. Highway portability is featured.

Fairfield Unloader

For more details circle 139 on Enclosed Return Postal Card.

Concrete Chute and Pocket

Engineers of Universal Form Clamp Co., 1238 N. Kostner Ave., Chicago 51, Ill., have devised a simple method of providing a combination pouring pocket and concrete chute when tilted into position and secured with bolts to adjustable pilaster forms. After pour is made, bolts are removed and form is pushed back into place.

Form Panel Pocket and Chute

For more details circle 140 on Enclosed Return Postal Card.

Synthetic Truck Tires

A truck-trailer rig equipped one-half with natural rubber tires and one-half with tires of a new synthetic known as "Natsyn" has just been tested in a coast to coast and return run by Goodyear Tire & Rubber Co. of Akron, Ohio, makers of the new product. To assure equal test conditions, the tires were switched from one side to the other at regular intervals, with axle positions maintained. The truck carried a full payload and was driven at legal turnpike and highway speeds.

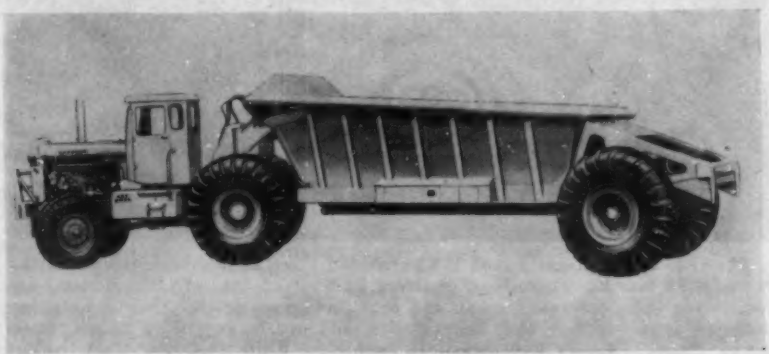
The "Natsyn" tires are reported by Goodyear to have performed equally as well as those of natural rubber.

For more details circle 141 on Enclosed Return Postal Card.

New Engineer's Tape

A ½-inch "premium steel" tape reading to tenths and hundredths of feet on one edge, and to inches and eighths on the opposite edge of the same face has been placed on the market by Evans Rule Co., Elizabeth, N.J. Available lengths are 50 and 100 ft. Markings are black on a white enamel surface applied to the bonderized steel and given an additional protective coating for wear. Each tape is equipped with standard hook and ring. Case is of metal sheathed in scuff-proof leatherette, with nickel plated winding handle.

For more details circle 142 on Enclosed Return Postal Card.



Athey Bottom Dump Trailer

Tucker Sno-Cat

Sno-Cat Uses 24 Tires

A variation of the Sno-Cat, from the Tucker Co., of Medford, Ore., has been produced employing 24 heavy duty truck tires in place of conventional tracks. The new off-the-highway truck has direct drive in all 24 wheels and is capable of moving through deep snow and mud and loose sand. Tires selected for the experimental vehicle are Firestone Super All Traction.

For more details circle 143 on Enclosed Return Postal Card.

New Chain Saw

McCulloch "Super 44" Saw

McCulloch Motors Corp., 6101 W. Century Blvd., Los Angeles 45, Calif., announces the "Super 44" direct-drive chain saw, with 6½ hp motor and a weight of 19 lb.—said to be the greatest power-to-weight ratio so far produced in this type of equipment. Blade length is 12 in., with 18, 24, and 30-in. blades available. Features include: all-position cutting, waterproof coil and automatic rewind starter for instant all-weather starting and fingertip keyboard controls.

For more details circle 144 on Enclosed Return Postal Card.

High-Strength Sign Letter

Following the equivalent of three years of "on-the-road" testing under all weather and climatic conditions, a new reflectorized, demountable cut-out sign letter is offered by Traffic & Street Sign Co., 84 Foundry St., Newark, N.J. It is designed to equal the latest criteria for daytime legibility combined with a nighttime reflectorized stroke width equal to Bureau of Public Roads Series "C." Structurally, the sign is of high strength, aircraft-type aluminum, alodized and finished in triple-coat baked enamel, with reflectorization superimposed. Letters, numerals or symbols are mounted flat on either wood or metal backings.

For more details circle 145 on Enclosed Return Postal Card.

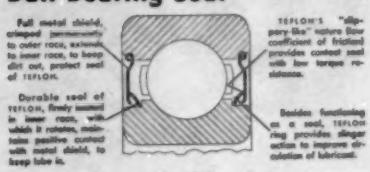
Remote Control Clutch

Twin Disc Clutch Company, Racine, Wis., recently announced the addition of 8-in., 10-in. and 11½-in. sizes to its line of "PO" air clutches. They are available in triple-plate, double-plate and single-plate construction and have a maximum torque capacity of 3,503 lb-ft. An exclusive feature is the cartridge-type diaphragm constructed of neophrene reinforced with nylon, and designed to eliminate leakage. Another feature is constant torque capacity without adjustment.

These clutches are designed for the convenience of remote air control wherever desired. Among uses listed are rock crushers, tractor winches, pipe-extruding machines, drilling rigs, machine tools, pug mills and other equipment.

For more details circle 146 on Enclosed Return Postal Card.

Ball Bearing Seal


Full metal shield, crimped permanently to outer race, extends to inner race, to keep dirt out, protect seal of TEFLON.
Durable seal of TEFLON, firmly seated in inner race, with which it rotates, maintains positive contact with metal shield, to keep lube in.
TEFLON'S "slippery-like" nature flow coefficient of friction provides contact seal with low torque resistance.
Besides functioning as a seal, TEFLON ring provides slinger action to improve circulation of lubricant.

Hoover Ball Bearings

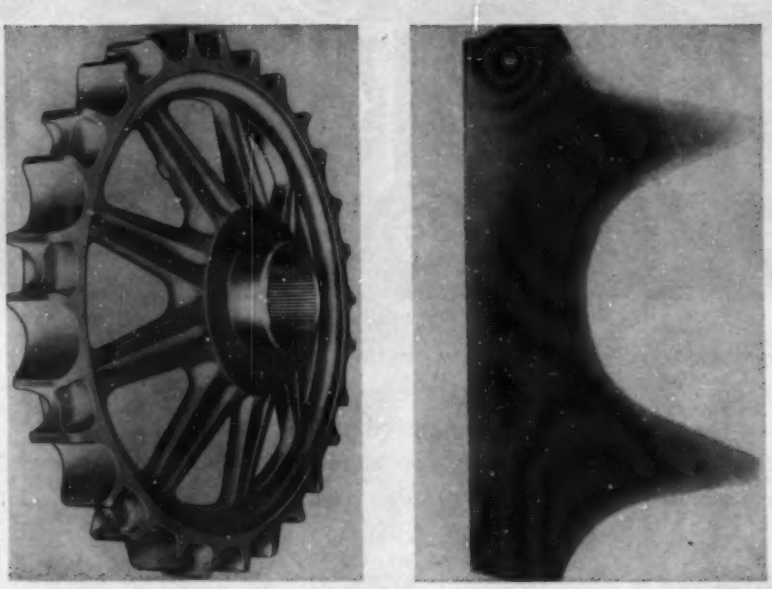
A new line of ball bearings with seals, designed to provide positive line contact between the inner raceway and the permanently attached full metal shields, is a recent development of Hoover Ball Bearing Co., Ann Arbor, Mich. The sealing element is named "Teflon," and sealing action is stated to be so effective that the original bearing lubrication will last normally as long as the bearing itself.

For more details circle 147 on Enclosed Return Postal Card.

Soiltest Labs for Iraq

The Iraq Development Board has purchased three mobile laboratories during the past 18 months. These labs, produced by Soiltest, Inc., of Chicago, are used for testing soils, concrete, asphalt and construction materials. They come either mounted on a truck or built in a trailer, and are in service in 25 countries. Above, Consul Usamah Kadi examines equipment while the New York consul general of Iraq, Hashim Hilli, looks on.

"Boralloy" Tractor Sprockets Last Longer



● **Boralloy sprockets and rim replacements last far longer than former types. The sprocket section illustrates the deep, even hardness made possible by boron. The complete sprocket shown is a Boralloy sprocket completely designed for the D8 to utilize the greater depth of hardness.**

An innovation in modern metallurgy promises god news to owners of earth-moving equipment. Setting an industry precedent, the element boron is being used to measurably increase the life of crawler tractor sprockets.

Marketed under the trade name Boralloy, these sprockets are now standard equipment on Caterpillar D8 and D9 tractors. Boralloy replacement rims are available for D8 sprockets.

Representing the first commercially successful attempt to produce boron-bearing cast carbon steel by the acid open hearth process, the Boralloy sprocket was developed as a cooperative research project between Caterpillar Tractor Co., and Harrison Steel Castings Company in the U.S.

Boron, an unglamorous element until recently, is now widely acclaimed as a worker of miracles. Boron chemistry is opening up new concepts in the fields of automotive fuels, jet and rocket fuels, plastics, pharmaceuticals, nuclear handling and control equipment, abrasives and super alloys.

In steelmaking, minute amounts of boron are added to improve depth of hardness resulting from heat treatment. The ability of boron to produce depth of hardness, or "hardenability," has been recognized for many years.

Under the direction of the SAE War Engineering Board, Caterpillar began its first large scale operations with boron steel. Thirteen companies shipped boron steels to Caterpillar and other organizations for testing. Several types of boron steels proved to be suitable alternates for many conventional steels of higher alloy content. By 1945, a great amount of boron steel had been used in the manufacture of tractor parts and other war material.

The first applications in which Caterpillar used boron steels included large diameter studs and bolts and certain relatively new low-alloy steels of the 8600 plus boron series. This steel was used mainly in heavily loaded parts of large section. A later achievement, the 9400 plus boron series, was developed for shafts and gears. When World War II ended, a few companies including Caterpillar continued to use considerable amounts of boron-containing steels. During the Korean conflict once again the steel-makers took a long and critical look at the possibilities of boron, this time remembering its successful use in high wearing, heavy section steel castings for tanks.

The weight and horsepower in the newly unveiled D9 tractor in 1955, and the increased power of the D8, brought about the need for a long-lived sprocket which would defy continual punishment. The recent decision to use boron steel in sprockets followed cooperative research with Harrison Steel Castings Company. Since late 1956 all D8 and D9 sprocket castings have been poured from boron steel.

For more details circle 149 on Enclosed Return Postal Card.

New Fuel Additive

Rhodia, Inc., 60 E. 56th St., New York 22, N.Y., has announced a diesel fuel additive to reduce offensive exhaust odors from buses, trucks, construction equipment and stationary installations. The trade name is "Alamask DI-ZK." No special handling or blending is required. Tests are reported to show no adverse effects on engines or their efficiency.

For more details circle 150 on Enclosed Return Postal Card.

New Warning Light

Partronics, Inc., Dept. AV, 2421 Elmwood Ave., Buffalo 17, N.Y., has just brought out the "Owl-Lite" model P-8 two-way flashing warning light.

The flash is said to be visible for over one mile. Combined switch and flash rate control is inside the waterproof sheet metal case, protected against weather and tampering. Compactness and long battery life are featured. The model P-8 is designed for mounting on wood or metal barricades or on a warning stand also manufactured by Partronics.

For more details circle 151 on Enclosed Return Postal Card.

Texas Using New Signs for Marking Interstate Routes

The Texas highway department, which is out ahead on Interstate road construction, has been quick to adopt the new route marker design selected by the AASHO for Interstate highways.

Pictured here is an example of the new style signs, the Texas Highway 75 sign—red, white and blue shield with white numerals on blue background, the upper portion being in red. The route numbering in Texas, as in other states, is following the adopted procedure of having no Interstate route number duplicate a U.S. route number.

The Texas highway department has made a widespread issue of the route map showing the location and Interstate route designation numbers for the Interstate System links within the state, to help motorists become familiar with the new numbers.

● **New Interstate sign in Texas**

Whatever Your Requirements

SPECIFY... TIMKEN-DETROIT®

Cross-country trucking . . . quarrying . . . logging . . . mining . . . heavy construction . . . whatever your on- or off-highway hauling needs—one of the products in the complete Timken-Detroit line of lightweight, medium and heavy-duty, and planetary tandem driving axles will assure you more productive work time—faster, more economical maintenance . . . smaller parts inventory!

TIMKEN-DETROIT LIGHTWEIGHT TANDEM

gives you greater payload capacity. Up to 700 pounds lighter than any other unit of equal capacity, this new lightweight tandem will give you up to 26,000 extra ton-miles of payload in every 75,000 miles of operation.

TIMKEN Detroit AXLES

TIMKEN-DETROIT AXLE DIVISION
ROCKWELL SPRING AND AXLE COMPANY
DETROIT 32, MICHIGAN

Accepted D A Standard

TRADE MARK REGISTERED

for Tandem Driving Axles

Products of

Rockwell Spring and Axle Co.

TIMKEN-DETROIT HEAVY-DUTY TANDEM

with large rugged double-reduction gears is unequaled for dependable, economical operation under toughest conditions. Exclusive "Cradle Ride" suspension, with its long, resilient, floating springs, reduces road shock, stabilizes the load, and improves driver control. Some Timken-Detroit medium and heavy-duty tandems are available with worm drive.

ONLY TIMKEN-DETROIT OFFERS YOU ALL THESE EXCLUSIVE FEATURES AND ADVANTAGES!

Timken-Detroit Inter-Axle Differential divides torque evenly between axles, yet permit wheels of one axle to revolve faster or slower than wheels of other axle. Both axles do equal amounts of work. Driving parts and tires last longer. Controlled from the cab, the differential can be locked out at any speed to give positive through-drive.

Timken-Detroit "In-Line" Propeller Shaft Drive gives you straight-through drive. Bearing and gear life is greatly increased because universal joint working angles are materially reduced.

Unequaled Parts Interchangeability means easier maintenance. Almost all parts in TDA® tandems—gears, pinions, differentials and brakes—are interchangeable with parts from Timken-Detroit standard single axles. This means more productive operation time—fast, simple, economical maintenance, smaller parts inventory.

Famous Torsion Flow Axle Shafts are made even stronger through the use of more splines and greater root diameter.

Timken-Detroit Rectangular Shaped Axle Housings are forged from high carbon steel. This shape, plus TDA full strength corner sections, provides greatest strength possible with minimum weight and size.

Timken-Detroit Hypoid Gears with their larger pinions and greater tooth contact give outstanding performance, top efficiency and long life—plus lower maintenance costs.

Dependable Heavy-Duty "P" Series Air Brakes utilize a unit-mounted design to make a compact self-contained assembly. Open type spiders mean lower temperatures, longer liner life. Tapered "Econo-liners" provide greatest thickness in area of greatest wear.

©1957, RS&A Company

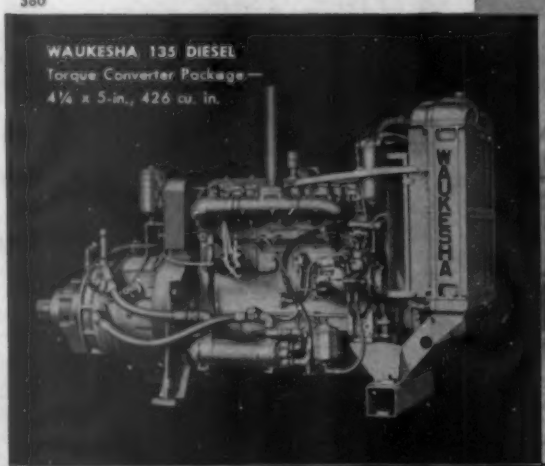
WORLD'S LARGEST MANUFACTURER OF AXLES FOR TRUCKS, BUSSES AND TRAILERS

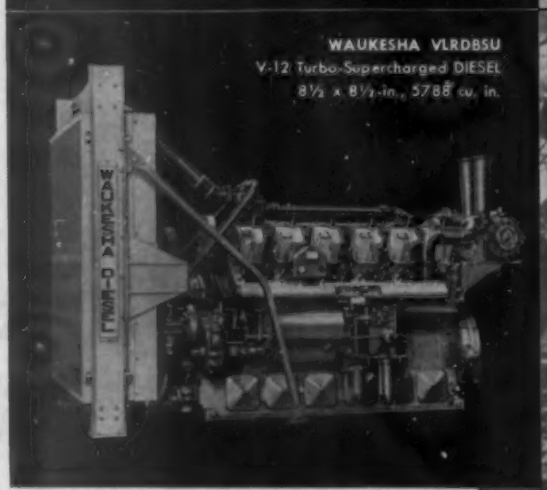
. . . for more details circle 300 on enclosed return postal card

Profit-Paying WAUKESHA POWER

FOR CRANES AND SHOVELS

360





Complete size range to 1235 hp... all standard fuels.

HANSON QUALITY HCM

THEW Lorain

CLARK EQUIPMENT

GarWood

Manitowoc

MICHIGAN

LINK-BELT SPEEDER

"QUICK-WAY"

KOEHRING HEAVY DUTY

INSLEY

BAY CITY

ORTON Torque-Control

MARION

LIMA

AMERICAN HOIST

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN

New York • Tulsa • Los Angeles

... for more details circle 307 on enclosed return postal card

Largest AGC Board Meeting Acts on Many Problems

Highway contractor, Fred W. Heldenfels, Jr., of Texas, nominated to head the Associated General Contractors in 1958.

The largest midyear board meeting in the history of The Associated General Contractors of America was held in Seattle, Wash., September 9-11. More than 500 representatives of leading construction firms and most of the 125 chapters and branches attended as guests of the Seattle and Mountain Pacific AGC chapters. The group represented the almost 7,000 AGC member firms who do about 80 percent of the contract construction performed in the United States.

Action by the Governing and Advisory Boards included:

- Nomination of vice president Fred W. Heldenfels, Jr., Heldenfels Brothers, Corpus Christi, Texas, for 1958 president, and James W. Cawdrey, Cawdrey & Vemo, Seattle, for vice president.
- Election of officers and 27 national directors will be by mail ballot in December, and installation will take place at the AGC's 39th annual convention in Dallas, February 10-13, 1958.
- Recommendation that Congress study problems arising under Davis-Bacon laws, toward making needed amendments, including provision for court review.
- Reiteration of need for strengthening provisions in the Taft-Hartley Act banning secondary boycotts, and a call for legislation to eliminate the "no man's land" existing in federal-state jurisdiction over unfair labor practice cases.
- Re-emphasis of need for holding negotiated wage and other labor benefits to reasonable levels in order to reduce inflationary pressures.
- Recommendation that chapters and members continue to develop strong labor committees to cope with a trend of some unions to bargain with unqualified or irresponsible employer groups.
- Recommendation that chapters and members resist inclusion of any restrictive provisions in labor agreements.
- Approval of steps to establish a national joint cooperative committee between the AGC and the four major groups representing mechanical specialty contractors.

The boards also noted that general contractors "maintain complete responsibility for the (construction) project to insure an orderly progression of work, harmonious subcontractor relations, and maximum service to owners," in order to preserve the single contract method of construction.

AGC recognized the efforts made by the cement and steel industries to expand their facilities to alleviate material shortages. Cement supply is now adequate, AGC reported, despite the recent strike, and deliveries of heavy structural steel shapes and plates are reported normal in many areas.

In the first general session, after brief remarks by AGC president Lester C. Rogers, Chicago, executive director James D. Marshall presented his midyear report to the boards. He pointed out that the future can be a "bad period" for contractors, in spite of large construction volume, because of inflation, tax demands and "confusion" within the labor movement.

Highway contractors heard president Rogers report on recent discussions between the AGC and the American Road Builders Association and gave a vote of confidence on his work to improve cooperation between the two groups.

William A. Bugge, president of the AASHO and director of highways for Washington state discussed highway legislation due before Congress next year.

The meeting approved a motion recommending that the AGC support legislation which the AASHO expects to have introduced in the next session of Congress, correcting a situation that prohibits the Bureau of Public Roads from reimbursing state highway departments for money paid to contractors for materials until they are actually incorporated in the work.

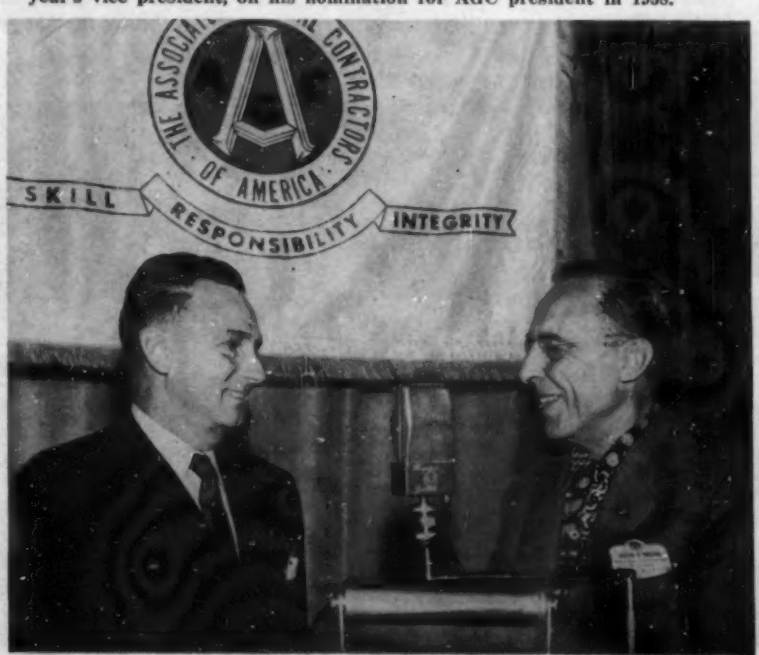
Also approved was a motion authorizing continued AGC discussions with AASHO on the problem of lump-sum bidding.

Some of the AGC committee activities:

Accident Prevention. Committee chairman H. B. Alexander, Harrisburg, Pa., predicted that a new high of 55 percent of AGC member firms will cooperate in the association's accident prevention program by submitting statistics for the reporting year ending this month.

Contract Forms. Chairman Robert W. Long of the Contract Forms and Specifications committee reported on AGC actions in furnishing General Services Admin-

● AGC president Rogers (right) congratulates Fred W. Heldenfels, this year's vice president, on his nomination for AGC president in 1958.



istration with documents to be considered as basis for revision of the standard government construction contract.

Task units reported on: Corps of Engineers meeting which resulted in agreements on bid openings and other matters; AASHO-AGC discussions concerning state highway specifications; establishment of the Division of Development within Bureau of Public Roads which will consider new techniques; action taken on building specifications in connection with a request from the Conveyor Equipment Manufacturers Association.

Insurance. The liability problems faced by general contractors who participate in disaster relief was considered by the Insurance committee which recommended that AGC establish a national joint cooperative committee with the National Association of Casualty and Insurance Agents and the National Bureau of Casualty Underwriters to consider this and other problems.

Chairman C. L. Davis, Kalamazoo, Mich., also reported that his committee considered revisions for the AGC insurance check list and plans to submit a revised list at the 1958 convention.

Material Supply. The 1956 AGC study of the 10-year construction volume outlook and steel and cement requirements was helpful to both industries in producing adequate supplies, according to a report by the Material Supply committee. The committee report was presented by Charles B. Solomon, Boston.

Subcontracting Procedures. The Subcontracting Procedures committee reviewed the status of the Federal Construction Contract Procedures Act and agreed with the AGC Legislative Committee that neither the House nor Senate version of the bill should be opposed by the AGC. The report, presented by chairman John A. Volpe, Malden, Mass., also recommended the formation of a national joint cooperative committee with specialty subcontractors and stressed the single contract method of construction.

The board meeting heard reports from several joint cooperative committees which the AGC maintains with other segments of the construction industry.

The Associated Equipment Distributors-AGC Joint Cooperative committee met in Seattle and discussed results of a survey of relations between contractors and equipment distributors, with emphasis on escalation, financing trade-ins, and service.

A report on regional meetings of the AASHO-AGC Joint Cooperative committee was made by co-chairman M. Clare Miller, McPherson, Kan. A national meeting of the committee will be held in Chicago November 18 at the annual convention of the American Association of State Highway Officials.

Subjects to be discussed at the Chicago session include lump-sum bidding, execution of bond, payment for delivered materials, railroad protective insurance endorsement, size of highway contracts, relocation of utilities and diversion of highway funds.

Contractor members of the National Association of State Aviation Official-AGC Joint Cooperative committee met at Seattle and agreed to recommend to NASAO "in the strongest possible terms" a cooperative program with these objectives: (1) recognition of the need for additional airport facilities throughout the country to meet the progress being made in aircraft development and the increase in air travel, and (2) the possibility of legislation authorizing federal-aid airport construction on a basis similar to federal-aid highway construction.

Contractor Failures Rise

Failures among highway and street contractors do occur, even in times of high construction volume. Figures released by Dun and Bradstreet, Inc., show that contractor failures during the first four months of 1957 totalled 18 firms with combined liabilities of $1,321,000. This compares with 15 firms with liabilities of $758,000 for the first four months of 1956. The rate is also upward for other non-building contractors, including those who build sewers and other heavy and miscellaneous construction.

The relatively small number of such firms is in contrast, however, with the very large number of failures in the field of building contractors. These, together with their subcontractors totalled 684 failures during the first four months this year, up sharply over a preceding year.

"Have Crusher, Will Travel", Good Slogan Here

Virtually every item on this crusher operation, shown working at Buckley Field Air Force Base, near Denver, Colo., keeps its "power packed, ready to travel," and can be moved to another job on a very short notice.

In addition to the mobile Master and Commander, Jr., Cedarapids crushers, being used here, the two International UD-1091 power units that drive them also are on wheels. One of the pair of Internationals is shown in the foreground and the other in the background mounted on a truck.

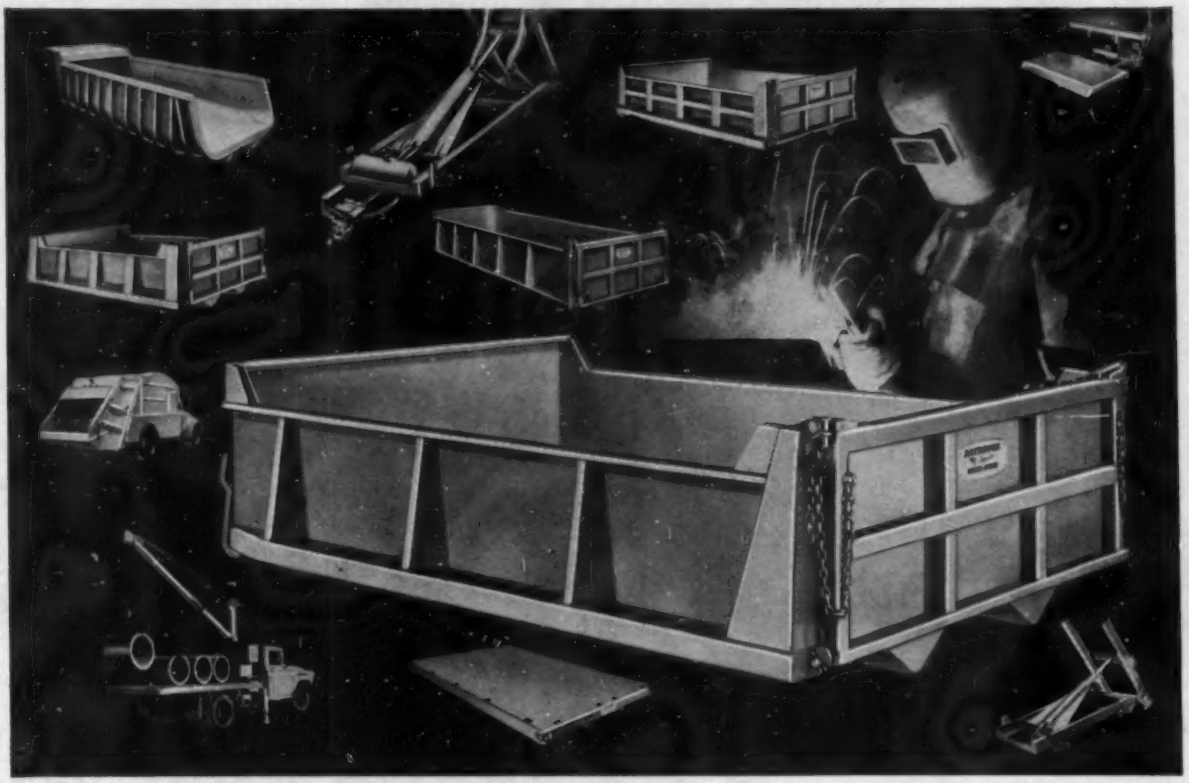
Monaghan and Smith, Denver contractors and owners of this mobile set-up, is using the dual crushing operation to produce ½-in. minus rock for use in runway overlay at the air field.

Production here runs to 160 tons per hour with the Master, producing 60 per cent and the Commander 40 per cent of the output. When the crushers are making 1-in minus stone, this production more than doubles. A Northwest 2 yd. dragline loads the Master, while the Commander is loaded by a Lima 1½ yd. dragline. An International R-Line truck is being loaded at right.

● **Production of 160 tons per hour was accomplished here, with "everything on rubber" and ready to roll out to new location.**

LOOK TO DAYBROOK

...for a New Standard of Workmanship in Truck Equipment for Street or Highway Work!



Daybrook Dump Bodies and Hoists, long a favorite for street and highway work, are now sharing top recognition with other outstanding units of the complete Daybrook line of materials handling equipment for trucks—Power Gates, the Power Loader (truck crane) and Power Packers (refuse bodies).

Today, Daybrook serves municipalities and local and state governments, the world over, in many ways. The dumping of loads for new construction or repair work and the handling of materials on and off trucks speeds up all operations and favors lower costs with speed and greater safety.

If the loading and unloading of trucks for any material, load, or capacity is building up budget problems, then Daybrook can solve them with dependable equipment best suited to the purpose.

You'll like the new Daybrook standard of built-in quality... and the economy of longer service life, too!

SEND DAYBROOK LITERATURE CHECKED BELOW: 68

POWER LOADER ☐

POWER PACKER ☐

POWER GATE ☐

DUMP BODY—HOIST ☐

DAYBROOK Speedlift® TRUCK EQUIPMENT

LAYCO

DAYBROOK HYDRAULIC DIVISION
L. A. YOUNG SPRING & WIRE CORPORATION
BOWLING GREEN, OHIO

Sign below, attach coupon to letterhead and mail in envelope.

Name

... for more details circle 255 on enclosed return postal card

Power shovel breaks down . . .

So quarry moves boulders with

All over the country, more and more dirtmovers are finding Michigan Tractor Shovels can effectively handle jobs once considered much too tough for rubber-tired equipment.

You've probably read about—or seen—Michigans digging pit-run gravel. Or breaking out reinforced concrete. Or clearing brush. Now here's another dramatic application.

Maintains pit production

The company involved, a large northeastern firm, had always had trouble maintaining pit production when any of their big power shovels broke down. One time this happened, they had a Michigan Tractor Shovel in the pit on demonstration. They decided to put it through the rugged test of rock loading.

Now own six Michigans

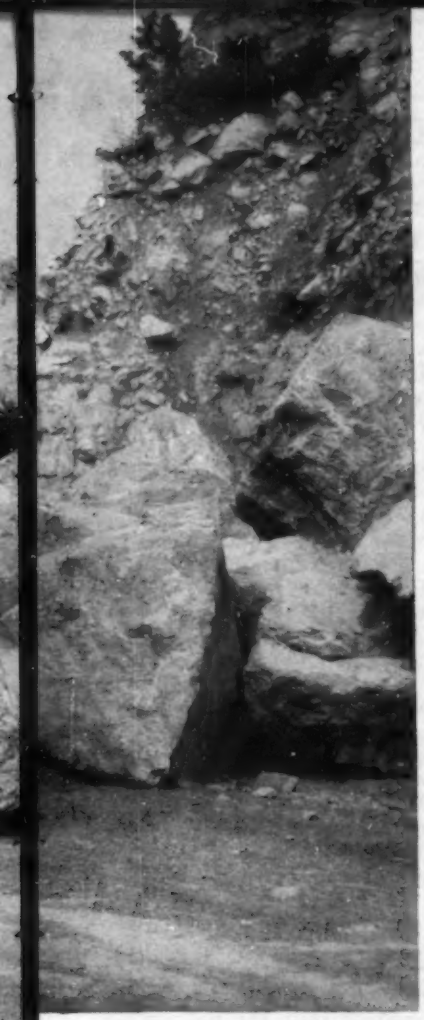
That was in 1954. Today, this company owns *six Michigan Tractor Shovels!* In emergencies these units effectively handle both rock loading and cleanup. They also handle *all* truck-loading of screened aggregates and other products of the multi-million-ton crushed stone plant. Management estimates their output "definitely greater" than output of loaders formerly used. Maintenance costs, over periods ranging up to three years, have been "satisfactorily low".

Boulders weigh up to 7 tons each

Note the photos. Above, one of the company's five 2¾ yard Michigan Model 175A's is moving huge boulders to stockpile for later sale as rip-rap. Each chunk weighs ½ to 7 tons . . . yet at no time has operator reported trouble handling them. Upper right, another Model 175A loads shot rock at the quarry face. Michigans' unobstructed dumping height, power shift, and power steer helps speed both emergency assignments.

Load 10 tons in 2 to 3 minutes

Stockpile loading (lower right) keeps the company's



This is the type of shot rock that must be loaded into trucks for transport to crushers. Michigan Tractor Shovels must be able to take a lot of punishment—and they do!

A full bucket *every* time saves trips, cuts handling costs of loading crushed stone or sand. This load weighed out at 7,000 lbs. This model Michigan can lift 15,000 lbs.

2¾ yard Michigan

2 yard Model 125A and most of the 2¾ yard Model 175A's busy most of the time. Good mobility and unexcelled breakout, *equally great* through the entire lifting arc, make quick work of this job. The Model 125A needs only 3 minutes to heap a typical 10 yard truck . . . the bigger Model 175A's require only 2 to 2½ minutes.

24 mph travel speeds odd jobs

Michigan speed pays off on odd jobs, too. Like cleanup of haul roads, stockpiles, and around crushers. Pushing loaded trucks up grade. Setting utility poles. Hoisting crusher screens and other heavy equipment. Switching railroad cars (up to 25 empties at once). Plowing and removing snow. Despite year-around work averaging 50 hours a week, company officials report "downtime negligible." And continuing, "The all-Clark-built, all-matched power train sure boosts efficiency. From power shift, power steer and 3-to-1 torque converter to planetary wheel drive axles . . . our '54 model has the same components as our newest rig . . . which certainly proves how good the Clark design is. We like the speed of loading . . . the speed between job sites . . . the excellent performance on emergency rock-handling . . . the lack of downtime . . . the ease of maintenance. That's why we've been repeat-buyers five times!"

Make your own test

A demonstration, gladly arranged by your local Michigan Distributor, will show you why you too should be a Michigan Tractor Shovel buyer. Put the demonstrator on your toughest loading jobs . . . we'll bet *our cost* of the demonstration *against your time* you'll really be *enthusiastic* about the results.

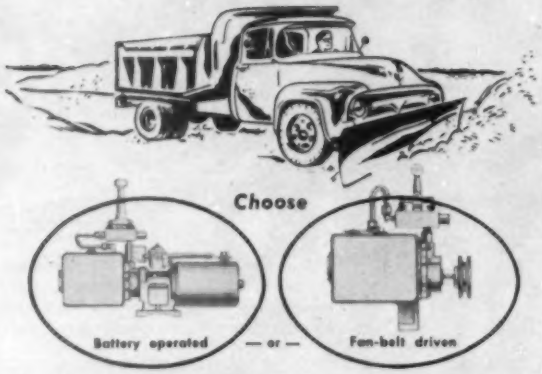
. . . for more details circle 251 on enclosed return postal card

Michigan is a registered trade-mark of

CLARK® EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Division
2497 Pipestone Road
Benton Harbor 42, Michigan
In Canada: Canadian Clark, Ltd., St. Thomas, Ontario

Lift Snow Plows . . . automatically!



MONARCH POWER HYDRAULIC CONTROLS

Snow removal is fast, dependable and safe with Monarch Power Hydraulic Controls. Cab-controlled for one-man instant action, the Monarch zips snow plows into operation with ease and speed. See your dealer or write for full details.

MONARCH ROAD MACHINERY COMPANY
1331 MICHIGAN ST., N.E.—GRAND RAPIDS 3, MICHIGAN
. . . for more details circle 283 on enclosed return postal card

The modern, effective way to handle cement for rear discharge!

OMAHA STANDARD

Air-Slide
CEMENT TRAILER

incorporates the Fuller Air Slide Principle

Will cleanly evacuate 100 barrels of cement in 10 minutes. No pounding or vibrating necessary. Air pressure gives complete rate of evacuation control. Low height and perfect load distribution. Fast loading through a minimum of 3 roof hatches. Hopper bottom gravity flow models also available.

Prices and weights quoted on request.

Distributorships available in certain areas

"Custom-Made Material Trailers—for ANY Commodity"

OMAHA STANDARD
2401 W. Broadway, Council Bluffs, Iowa
. . . for more details circle 285 on enclosed return postal card

Court Decisions
Contractors Should Know

Damages Waived in Maryland

Extensive Road paving in Maryland had been undertaken by a construction company. To facilitate the deliver of cement for the job, the construction company had obtained permission from the Baltimore & Ohio Railroad to install and operate a portable unloader for a year on a railroad siding.

In a collision between a cement hopper car and a B. & O. work train, due to the negligence of the railroad, not only was the unloader damaged but a quantity of cement lost by the construction company.

Suit was brought against the railroad for this negligence and the defense set up that the contract made between the construction company and the railroad contained a clause by which the construction company agreed "To assume all liability for any and all loss and damage to property and claims for injury to or death of persons in connection with or growing out of the use of said premises."

The construction company contended that this provision did not absolve the railroad from damages occurring from its own negligence. Refusing to follow this argument and denying the construction company a recovery the court said:

"The terms of an indemnity agreement may be so broad and comprehensive that although it contains no express stipulation indemnifying against a party's own negligence, it accomplishes the same purpose.

"In such a case the presumption is that if the parties had intended some limitation of the all-embracing language they would have expressed such limitation. We think the language here used was so comprehensive as to include damages resulting from the railroad's negligence even though the damage was suffered by the construction company."

Princemont Construction Co. vs. Baltimore & Ohio R. Co., 131 Atl. 2d 877, D.C., May 14, 1957

"Hot Cargo" Clauses Upheld

"Hot cargo" clauses of a collective bargaining agreement may be enforced by a union without violating the provisions of the labor statutes, by instructing employees to refuse to handle the goods of a struck employer, was held by the United States Court of Appeals on June 19th.

The clause in this instance was, "It shall not be a violation of this agreement for members of the union to refuse to handle material in the possession of the employer received from any employer with whom Local * * * is directly engaged in dispute provided such material comes into the employer's possession more than 48 hours after the union gives written notice to the employer of the existence of such labor dispute."

In its reversal of an order of the National Labor Relations Board in this instance, the Federal court said, "The employer obviously cannot impose additional work on the employees contrary to the agreement and then charge that their refusal to perform it constitutes an unfair labor practice."

Milk Drivers & Dairy Employees Union v. N.L.R.B., U. S. Court of Appeals, June 19, 1957. '57 A.L.C. 1023.

Interest Net Tax Exempt

Claim of exemption was made by a dealer in road machinery from the Federal income tax on interest payments which it received under bailment lease contracts in the sale of road equipment to cities and other political subdivisions.

The United States Internal Revenue Code provides that interest upon the obligations of a state, territory or any political subdivisions thereof shall be exempt from taxation.

The usual meaning ascribed to the word "interest," said the Tax Court, is the amount one has contracted to pay for the use of borrowed money. The taxpayer here, continued that court, contends that it is not necessary that an obligation to pay interest be set forth specifically with definite rates and terms of interest but that it is sufficient to show that its policy was to charge 6 percent interest with respect to all of its lease agreements.

"We are of the opinion that taxpayer's contention is without merit," said the court in conclusion. "There is no evidence that these contracting parties had executed in the exercise of their borrowing power, any written agreement with this taxpayer that they would pay interest on their past due debts."

Newlin Machinery Co., 28 U. S. Tax Court, No. 93, June 28, 1957

Right of Materialman to Lien

Fuel oil and grease had been supplied a subcontractor in the construction of a farm to market road in Red River county, Texas, for which the materialman had filed a lien. In the foreclosure suit the general contractor set up in its defense that it owed the subcontractor no money when the lien of this materialman had been filed. In that state the lien of a materialman under the statute attached to "any monies owed to the contractor."

In holding that the fact that no money was due the subcontractor did not defeat the lien but that it was determined by the amount due the general contractor, the court said, "The right of the materialman cannot be made to depend on the state of accounts between the contractor and subcontractor at the date of service of written notice."

John F. Buckner & Sons v. Arkansas Fuel Oil Corp., 301 S.W. 2d 325, Texas, February 7, 1957

Measuring Rock Cuts

An excavation contract in highway construction in Minnesota provided that any rock cuts in the excavating would be measured as the volume within the grading section staked by the engineer plus the volume included between the staked back slopes and slopes distant 18 inches outside thereof measured horizontally, plus the volume above the surface 18 inches below the stated grade of the roadbed extended to the shoulder slopes.

For this excavation is was agreed the contractor should be paid $2.88 per cubic yard. In the decision of the action brought by the contractor against the state it was asserted by the court that the contract required compensation for the volume of rock cut excavations from shoulder to shoulder and 18 inches below the surface. This quantity, it was conceded, aggregated 2,734 cubic yards and for this excavation. Judgment was awarded the contractor for this excavation at the rate specified in the contract.

Ashbach & Sons v. State of Minnesota, 78 N.W.2d 446, July 6, 1956

Keep 'Em Flying...

Keep 'Em Rolling... with the FRINK ROLL-OVER SNO-PLOW

Rotates from Left to Right Hand Plowing Position IN 15 SECONDS

On runways and thruways, modern time tables depend on fast, efficient snow removal. The Frink Roll-Over Sno-Plow fills this need . . . works full plowing time because it can be reversed from left to right position in 15 seconds! No deadheading! Hydraulic controls in the cab quickly reverse the plow to throw all the snow in the direction dictated by the wind and disposal area location. On dual highways, the Roll-Over can discharge left, yet travel with the traffic.

This unique plow, with curved, tapered moldboard, operates safely at high speed . . . throws and spreads snow to eliminate high banks and subsequent drifting. And when the job is done, quickly and economically, the Roll-Over parks upright within its truck's width. For full details, write to Frink for catalog.

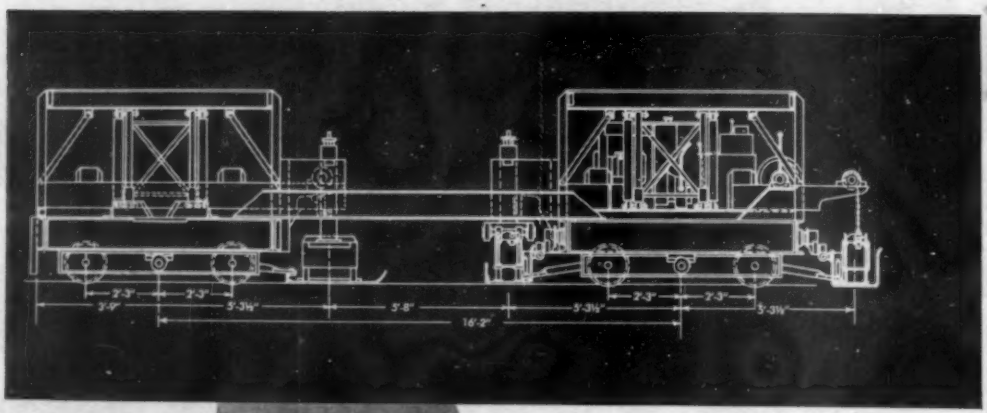
Other dependable Frink Sno-Plows (V-Type; One-Way and Reversible) can all be attached to the Roll-Over's lifting device assembly.

For Snow Plow Know-How It Pays to Think of FRINK SNO-PLOWS

Clayton, 1000 Islands, N. Y.
Frink Sno-Plows of Canada, Ltd., Toronto, Ontario

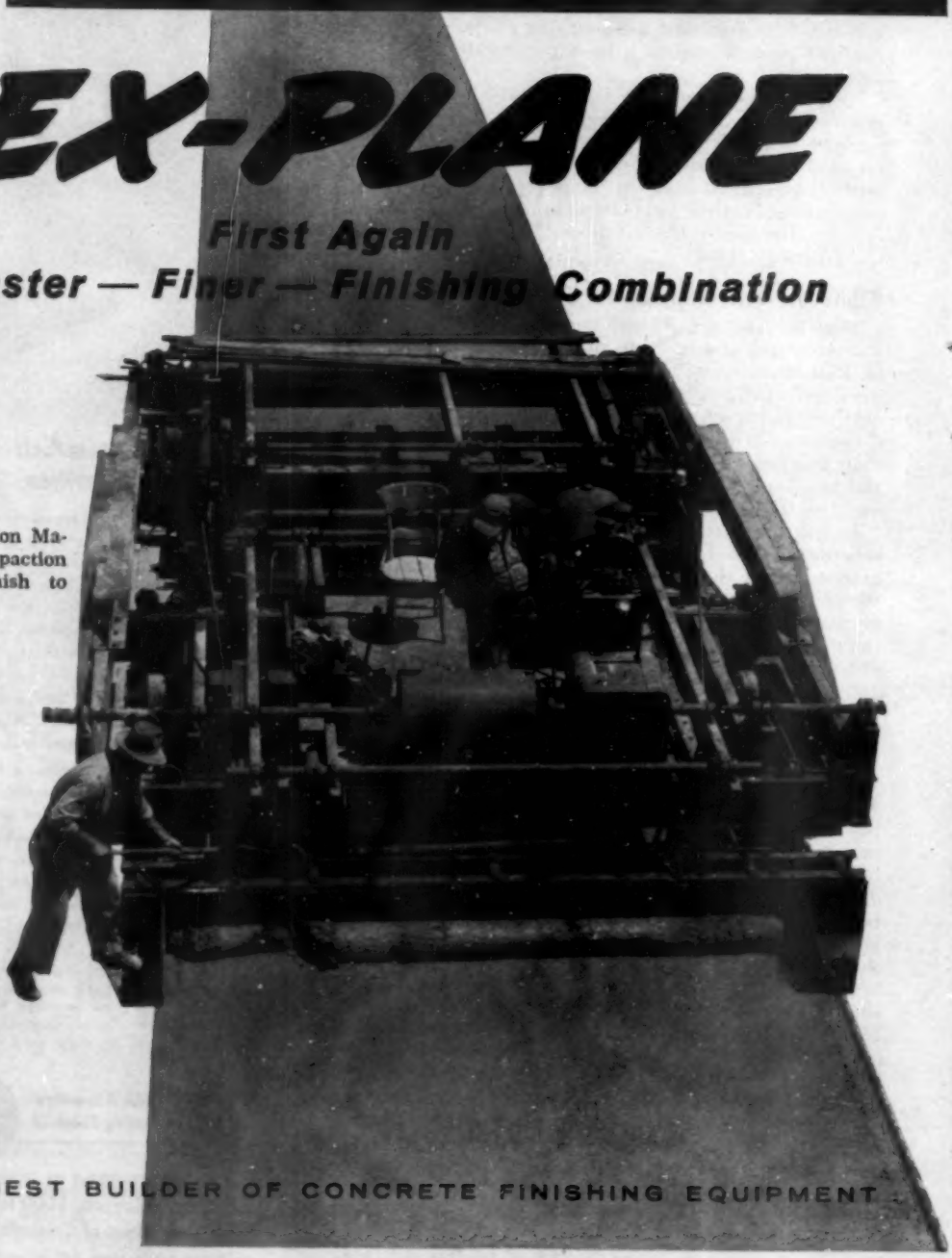
. . . for more details circle 263 on enclosed return postal card

Two Detroit Special finishing machine frames engineered into one rugged unit combining finisher and float operation. Equipped with quick crown change screeds. Supplied in either 12' to 18' or 20' to 25' working widths. Hydraulically controlled pneumatic tired transportation assemblies optional.



FLEX-PLANE

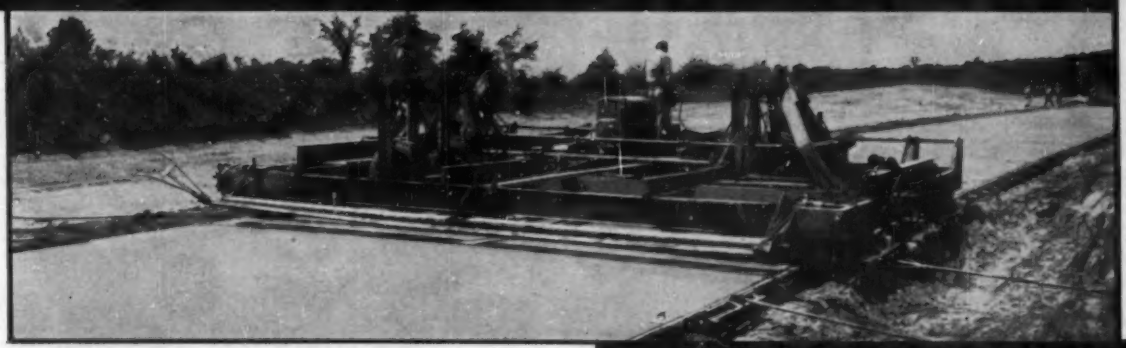
First Again
with Faster — Finer — Finishing Combination



"FLEX-PLANE" Combination Machine gives greater compaction and applies superior finish to Connecticut Turnpike.

WORLD'S LARGEST BUILDER OF CONCRETE FINISHING EQUIPMENT

U. S. ROUTE 16—near Farmington, Michigan. Loselle Construction's Combination increases daily finishing average



"... 4400 feet of 22-foot pavement finished in one day." ... "keeps up with three dual drum pavers." ... "450 lineal feet of 24' pavement per hour." These are typical reports from contractors using the revolutionary new Flex-Plane Combination Finisher-Float Machine which does the combined jobs of transverse and longitudinal finishers. On the average, users finish over 3000 feet of pavement a day, requiring only two or three hand finishers depending on type of joints being used.

On-the-job checks show longitudinal surface smoothness to be unsurpassed by any other equipment regardless of condition of forms. Results prove it to be the fastest, most efficient finishing machine in use today.

But why not get all the facts? Write today for your copy of the data-packed "Flex-Plane Finisher-Float Machine" brochure. See for yourself why contractors consider it the finest machine of its type in the world.

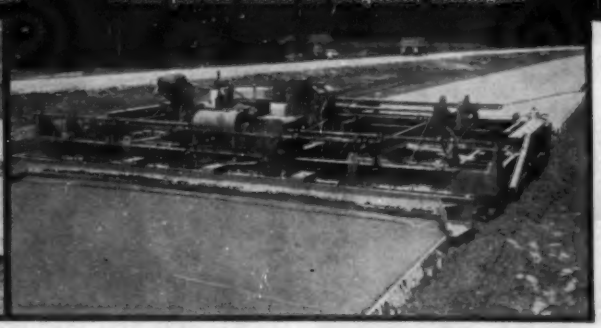
368

U. S. ROUTE 30—J. A. Jones Construction Company uses combination machine on straightaway paving—Flexplane self-widener on interchanges near Mansfield, Ohio.

CONNECTICUT TURNPIKE—DeLillo Construction Company's Combination cuts hand finishing to a minimum.

U. S. ROUTE 12—Kalamazoo, Mich., bypass is worked by Carl Goodwin & Sons. Contractors generally report substantial savings over previous finishing methods.

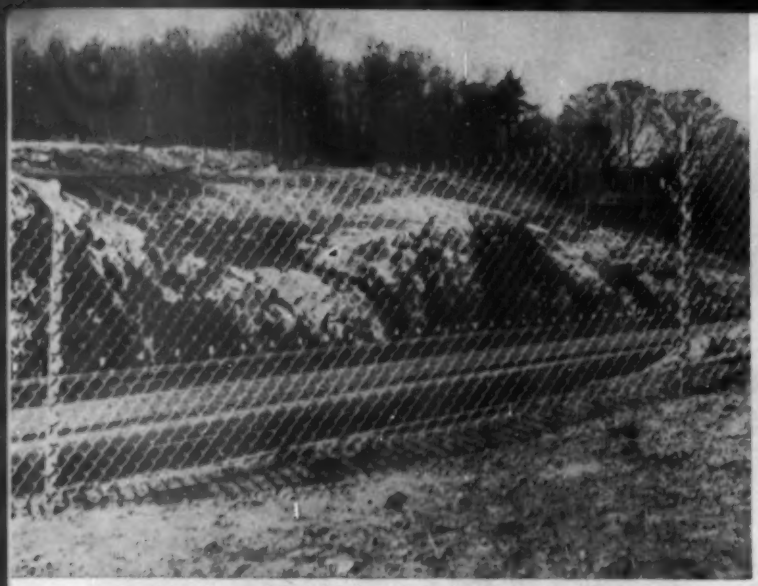
U. S. ROUTE 23—Combination Machine owned by Denton Construction Company keeps up with three dual drum pavers south of Brighton, Michigan.



THE FLEXIBLE ROAD JOINT MACHINE COMPANY

534 THOMAS RD., WARREN, OHIO

... for more details circle 259 on enclosed return postal card



● Section of completed Anchor chain link fencing over rock cut along right-of-way of Massachusetts Turnpike.

● Portable rock drill sinking holes for boundary fence on the Massachuetts Turnpike.

Portable Rock Drill Digs 12,000 Turnpike Post Holes

A NEW METHOD of driving fence and guard rail post holes that saved time and money is reported by the Anchor Fence division of Anchor Post Products, Inc. This firm employed a comparatively new type of portable rock drill in setting right-of-way fence on a 10-mile mountain section of the Massachusetts Turnpike.

The fencing which was done under subcontract to Gilbane Building Co. covered 100,000 ft. of stock fence, 20,000 ft. of chain link fence and 100,000 ft. of guard rail near Worcester, Mass.

The specifications required chain link fencing on the right-of-way boundary in the vicinity of high rock cuts and in settled areas, and stock fencing for other sections. Granite boundary markers were required at intervals of not more than 1000 ft. on the straightaway and all angle points, with steel pin markers (inserted in drilled holes) wherever rock occurred. Fence posts were spaced 10 ft. apart for chain link and 12 ft. apart for stock fence. Altogether the fencing involved more than 11,600 post holes and some 250 boundary marker holes.

About 10 percent of the post holes—amounting to some 1200 holes—occurred in solid rock. These were made 3 ft. deep. The fence crews had to work often at locations where access was difficult (often on top of 50-ft. high rock cuts and 150 ft. out from the turnpike centerline).

The unit that made this job easier was a Pinazza type P70 portable rock drill with wheelbarrow mounting. This drill required no compressor and could readily be transported to the job in the rear of a station wagon or light pickup truck. It can easily be unloaded by two men and wheeled or carried to the drilling location.

Posts used for chain link fence were 1⅞-in. H-beam sections. A 2½-in., four-point bit was used for drilling these holes. For the stock fence post holes, a 1¾-in bit was used to accommodate 1½-in. T-section posts. Boundary markers in solid rock consisted of 1½-in. diameter steel pins, for which a 1¾-in. hole was drilled to 1½ ft. depth.

Working with only a six-man crew, Anchor Fence easily kept ahead of construction. An important factor in the work was that the portable drilling equipment avoided the use of a heavy compressor which would have required trailing 150 to 200 ft. of air hose over rough terrain.

The Pinazza P70 portable rock drill, built to the design of Societa Brevetti Pinazza, Milan, Italy, was purchased from Pitnam Industrial Products Company. The domestically assembled unit consists of a power unit, flexible shaft and drilling hammer. The power unit is a standard 5 hp gasoline engine coupled through a rubber centrifugal clutch to a rotary blower which generates air to clear the drill hole. The drilling hammer, weighing 50 lb., is designed for drilling a 1½-in. hole to 16 ft.

● Portable Pinazza P70 rock drill on wheelbarrow mounting, which was used in the rugged Massachusetts terrain.

ARBA Technical Committees Increase Their Activities

The American Road Builders Association reports that the work of its 26 technical committees is broadening and expanding.

The newest of the committees, now being organized, are those pertaining to airport pavements and flexible type pavements. The former group is under the chairmanship of Henry J. Lichtefeld, chief of the technical branch of the Civil Aeronautics Administration; the latter is headed by D. D. Woodson, staff engineer of The Asphalt Institute, College Park, Md.

Three relatively new committees, all unusually active now, are those dealing with photogrammetry, highway illumination and electronic computers. One of the busiest and most interesting of all of the groups is the committee on roadside construction and maintenance.

He's cutting highway costs

This photogrammetrist is plotting precision contour maps from aerial photographs. He's doing weeks of work in a few days, and saving money all the way.

Savings begin with the photographs themselves. Planes can fly higher, cover larger areas with fewer photographs. High resolution and magnification of Balplex Plotter reveal vivid detail for dependable accuracy.

Speed and simplicity of Balplex operation assure prompt completion of maps at scales as large as 1"/50'—at today's lowest cost per map!

And . . . Balplex is the lowest-priced plotter in the entire field! Complete capital equipment for only $4600. (Reduction printer and centering device optional.)

with

Bausch & Lomb

BALPLEX

PLOTTER

MAIL COUPON TODAY FOR COMPLETE DATA

BAUSCH & LOMB

SINCE B&L 1853

BAUSCH & LOMB OPTICAL CO.
86323 St. Paul St., Rochester 2, N. Y.

☐ Send me B&L Balplex Catalog F-303

☐ Send me data on the complete B&L photogrammetric line

Name.....

Title.....

Business Address.....

.....

City..... Zone..... State.....

. . . for more details circle 242 on enclosed return postal card

TREMENDOUS RIPPING TEAM

The tremendous power of the IH TD14, TD18 or TD24, plus the 10,000-pound Greenville tractor-mounted rock ripper shatter rock and packed earth for easy scraper loading. On many jobs explosives, shovels and trucks are eliminated.

Put this power-packed team to work for you. Your IH dealer can give you the facts. Let him show you how you can save as much as 25% on any earth or rock moving job.

LIVE SWIVEL ACTION

Shanks swivel 15° in either direction . . . follow tractor like a trailer. Points have live action that shatters rock like a jack hammer.

RUGGED POWERFUL SHANKS

Scientific contour gives extra strength at strain points and pulls points down deep . . . rocks roll out and clear of headframe. Made of tough, heat-treated, manganese-moly steel. Mount one, two or three shanks as needed.

POSITIVE CONTROL

Double-acting hydraulic system provides fingertip control and puts full tractor weight on points for fast, deep penetration.

DRAWBAR TAKES PULL

The ATECO drawbar replaces the tractor drawbar and drawbar brackets. Clevis is accessible with ripper installed.

RIP AT ANY DEPTH

Easily adjusted to permit settings as deep as 24". Points are always at most desirable angle for best penetration and splitting action. Points are easily replaced.

WRITE FOR Greenville Bulletin IH-156. It gives complete data on the Greenville-Ateco ripper.

ATECO

GREENVILLE
STEEL CAR COMPANY

ATECO DIVISION
Greenville, Pennsylvania

. . . for more details circle 267 on enclosed return postal card

Bituminous ROADS AND STREETS

Published by Gillette Publishing Company,
22 West Maple Street, Chicago 10, Illinois

Unloading neoprene treated asphalt for an experimental installation. One of the test sections constructed recently in seven states in cooperation with DuPont engineers.

NOVEMBER, 1957

FANTASY YESTERDAY...

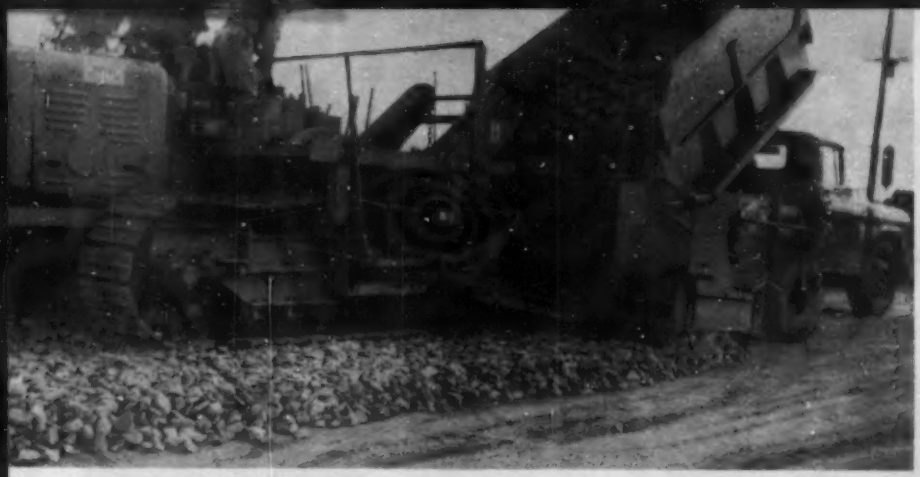
ROUTINE TODAY...

when asphalt's there to help!

The construction of roads and freeways that only yesterday were considered fantastic is now going full speed ahead. Thanks to asphalt this construction is easier, better and less costly. Comparative cost figures make it plain that in initial cost and in maintenance, asphalt saves millions on heavy-duty roads. And if you have driven on asphalt—and on anything else—that's all the argument you need in favor of asphalt for safer, more comfortable riding.

Sohio long ago established itself as one of the largest producers and sellers of asphalt in the nation. To maintain this reputation, two factors have been responsible—*consistent* top quality and Sohio's famous "round-the-clock" service that loads and delivers asphalt supply where and when it is needed *day or night*. To take advantage of this service, make Sohio *your* source of asphalt supply. Call or wire, Sohio, Asphalt Division, Midland Building, Cleveland 15, Ohio.

. . . for more details circle 294 on enclosed return postal card



● Blaw-Knox paver Model P-150 laying an even spread of macadam stone on SR 161 west of Granville, Ohio. Photo July 1957.

● Jackson vibratory compactor jarring screenings into voids to fill 5-in. macadam base. July 1957.

Limestone Macadam

For Heavy-Duty By-Pass Pavement

Old-fashioned water-bound macadam is part of the flexible pavement design for this project near Columbus, Ohio. Vibrator aided base compaction. High initial density of asphaltic pavement obtained with a 30-ton self-propelled rubber-tired compactor.

By Fred Swineford

Engineer-Director, Macadam Pavements, Inc., Columbus, Ohio

Crushed limestone with its interlocking particles is an economical method of obtaining base strength today as in the time of John L. Macadam. Modern equipment has merely speeded up the project, as is illustrated by these notes on a section constructed recently on Ohio State Route 161. W. L. Johnson Construction Co., of Columbus, was the contractor on this project, part of a by-pass around Columbus. The company used stone spreaders, rollers, vibratory compactors, supercompactors and pavers to secure mass production.

The pavement design consists of 9 in. of subbase, 5 in. of water-bound macadam, and 5 in. of asphaltic concrete, in conformance with numerous other Ohio pavements.

Following completion of the subbase, processed Delaware limestone was trucked 40 miles from the Scioto Quarry of National Lime and Stone Co. for the macadam course.

A Model P-150 Blaw-Knox paver spread and leveled the 1½-2½-in. crushed rock. A loose spread of 6½ in. depth was made to produce the 5 in. compacted course. Compaction was with 10-ton Huber-Warco 3-wheel rollers and a Jackson vibratory compactor. A Buckeye force-feed box spread the ⅜-in.-to-dust limestone screenings to fill the voids. Three applications of screenings were aplied. After each application the screenings were jarred into the voids with the Jackson vibrator.

After the voids were thoroughly filled the course was saturated with water from tank trucks equipped with pressure spray bars. A 10-ton 3-wheel roller equipped with a wide broom followed immediately to complete the water-binding.

After the macadam course was dry it was primed with 0.35 gal. per sq. yd. of MC-0. Then followed the three courses of asphaltic concrete (a 3-in. and two 1-in. courses) spread with a Barber-Greene paver and rolled with a Galion 3-wheel and a Galion tandem roller. Asphaltic concrete was processed and

● Galion 3-wheel roller follows Barber-Greene paver; then Bros 30-ton rubber roller, and Galion tandem to finish.

● Huber-Warco rolling and keying the macadam.

placed by Newark Asphalt Paving Co., of Newark, Ohio.

Higher initial compaction was attained on a portion of the job where a heavy Bros rubber-tired roller was used on the asphaltic concrete 3-in. base course. A brief description of this roller is of interest since it was an important tool in compacting the asphalt paving to a degree of density heretofore found only in pavements after a period of traffic service. The self-propelled Bros roller weighed 22,800 lb. net and 60,000 lb. loaded with sand. It had three tires in front and four on the rear; tires 13 x 24 in., 18 ply, smooth tread, inflated to 100 psi. This roller model is powered with a 98 hp Minneapolis Moline diesel motor, and has hydraulic steering and a torque converter which permits very slow speeds and dual chain drive. It rolls 7′-3″ wide and the over-all length is about 20 ft.

The compaction procedure was to follow the Barber-Greene paver with Galion 3-wheel and 10-ton steel roller. Then the 3-in. course was given two passes with the Bros 30-ton rubber-tired roller. This was followed by a Galion 10-ton tandem roller. Preliminary compaction reports indicated a density in excess of that obtained by conventional rolling.

The Ohio department of highways conducted extensive load bearing tests on the subgrade, the subbase and the macadam course. Plate bearing readings were taken both before and after compaction of each course with a 100,000-lb rubber-tired, towed roller.

This project was financed by the state of Ohio. The unit costs were as follows:

Subbase from wayside gravel pits, $1.00 per cu. yd.

5-in. waterbound macadam base $7.20 per cu. yd.

5-in. asphaltic concrete, $13.70 per cu. yd.

The project was built under direction of S. O. Linzell, director of highways, succeeded by Charles M. Noble, secretary to the governor, with Oscar Schilling and F. B. Chappelear, division engineers. Project engineer was John W. Hagan. W. L. Johnson's general superintendent was Paul S. Scott; Claren Saltzman in charge of the macadam.

● A contract for furnishing and directing 40 additional large warning signs on the New Jersey turnpike has been awarded Ernest Jarvis and Company, Newark, New Jersey. The low bid was $229,054. The neon-lighted signs will inform the motorist in advance of fog, snow and other emergency conditions.

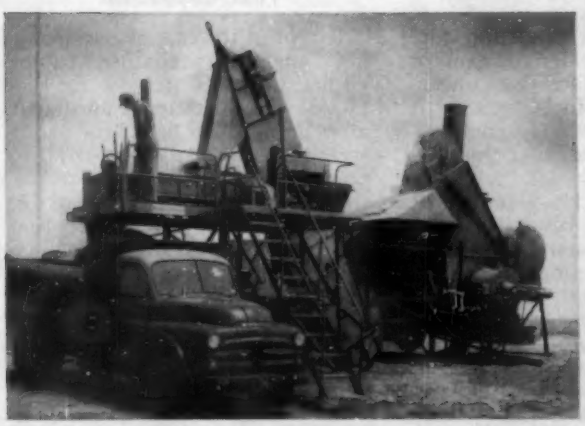
Old John Macadam Still Watching Over Us

They say the old macadam paving contractor is no more. While we respect his careful workmanship, which produced more miles of pavement than any other method, we no longer need the old timer's dump wagon, leveling harrow, hand rakes and smoking steam roller. Thanks to equipment manufacturers who now make big trucks, automatic spreaders and levelers, compression rollers and vibratory compactors to place macadam better and much faster.

The John L. Macadam principal of interlocking and filling crushed rock is still popular because it gives stability and durability not yet attained by any other type of pavement.—*Fred Swineford*

90% of the 15,000-mile Pan American Highway will be asphalt surfaced.

95% of the asphalt plant mix is produced or paved by Barber-Greene Asphalt Plants and Finishers.



Write for literature on the world's pace-setting road building equipment.

57-11-F

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

. . . for more details circle 241 on enclosed return postal card

VIEWS AND COMMENTS

. . . By H. G. Nevitt

THE COMPACTION OF ASPHALT MIXES

In the April issue of Roads and Streets we discussed the benefits to a road structure from ample compaction. There has been great interest in compaction for some time due to the reasons outlined in this discussion. The asphalt mat shares in these benefits, and emphasis on mat compaction and its control has increased of late for several sound reasons.

In the early days of cold mixes compaction was due to traffic alone, with the necessary smoothness obtained by blading during the traffic compaction period. Hand or machine laid hot mixes needed simply enough consolidation to avoid marking when turned over to traffic. However, traffic conditions on both highways and airports are now tending to change this. Heavier loads and sometimes higher tire pressures are demanding a greater degree of construction compaction before traffic can be permitted on the surface, particularly where the traffic is likely to be channelized. Likewise the structure is likely to need the contribution to support provided by the asphalt mat before appreciable further consolidation by traffic has time to occur. The initial or construction compaction must consequently be increased to insure this required strength at the critical structural or load carrying period.

With this need for greater compaction has come a more critical attitude as to the most effective means of obtaining it, and the necessary controls to assure that this has been done.

Steel Tired Roller

For many years the usual compaction device for hot mix pavements has been the steel tired roller in one or more types. Yet it is interesting to note that, with the exception of one characteristic—its ability to smooth out and even up the surface—the steel tired roller lacks nearly all the requirements of an efficient compacting device. First, neither its weight nor its contact pressure are readily susceptible of variation or control. Secondly, it cannot adjust itself to the needs of the surface as it compacts. Unfortunately consolidation of mats is not a uniform process of becoming more dense. Particle rearrangement is also required, and this adjustment occurs irregularly over the surface. Consequently the steel roller is likely to be riding on high spots at various times, with resultant lack of compaction in the low spots, possible aggregate degradation, and many other difficulties.

Pneumatic Rollers

In more precise engineering terms, compaction requires a device which provides constant—or, perhaps, variable but controlled—pressure, with displacement to suit; whereas the steel roller tends to provide constant displacement but varying pressure. Since the pneumatic roller is susceptible of both load variation and contact pressure control, and provides constant or uniform stress rather than uncontrollable or uniform strain, it would appear to be a far more logical piece of apparatus for the compaction job.

Pneumatic rollers have been tried out in compacting bituminous surfaces—though apparently not from the above reasoning—with outstandingly satisfactory results. Since a suitable spreader technique will give a final uniform layer of asphaltic mix to compact, any efficient compacting device should end up with a reasonably smooth surface.

Therefore, while the pneumatic roller does not give a surface which to the eye appears quite as smooth, actual tests show that it is equal, and after a number of years superior, to the steel roller in its compacting effect. This is because it uniformly densifies the mix if the construction procedure is carried out properly; while the steel roller will give a superficially smooth surface, but one which may later show irregularities under further traffic consolidation. Normally this difference or increased roughness is negligible, but if there is any advantage to either, the pneumatic will usually end up with a final smother surface provided the whole construction operation has been correctly carried out.

These principles may perhaps be best understood by a look at the writer's view of the optimum method of compaction with equipment presently available. We make this qualification because in due course the inherent advantages in vibration will undoubtedly be reflected in all types of compaction equipment. However, recognizing that vibration machines are still in the experimental stage from certain standpoints, we will outline the procedure which seems unquestionably the best pending their final development.

Final Compaction

Except in the case of certain difficult mixes, the preliminary rolling—what might be termed the hot phase—will be started immediately after the mix has been laid by the spreader. Special self-propelled pneumatic rollers, with quite low tire pressures and susceptible of low total weight, will be put on the mat while the asphalt is still hot and has a low viscosity. By sufficiently restricting the weight and tire pressure the loose mat can be consolidated to a considerable extent almost immediately. When this consolidation has reached the proper point, along in some cases with some cooling, the steel roller will then be put on the mat to smooth it up and give it a suitable appearance. Immediately following this steel rolling further compaction will be carried on with pneumatics, though utilizing higher tire pressures and heavier total loadings.

Generally speaking, this final compaction will be carried on by the pneumatic rollers up to the control point or desired density, although it is always possible that a finishing rolling with the steel roll-

er will then be utilized to give a final very smooth appearing surface.

What Advantages

What are the advantages of such a rolling program? There are several. First of all, since the rolling is carried on predominately at a mat temperature which will usually not permit the use of steel rollers initially, the energy input required will be far less and the effectiveness of the rolling pass will be far greater than is possible today with either steel rollers or with the usual fairly high pressure pneumatic roller. Secondly, due to the lower cohesion the orientation that is a desirable part of consolidation will be accomplished more easily and quickly. Usually not much orientation is achieved in mats until the very effective, though long drawn out, compacting effects of traffic are obtained. Finally, the density achieved by the procedure outlined should be far greater than possible today with any type of rolling at lower temperatures. The end result will be mats which develop their full strength at an earlier date, which better resist water infiltration, marking by traffic, distressing under channelized traffic and similar to a far greater extent.

Economy and Efficiency

Our need today is economy as well as efficiency in our highway construction. In the rolling of bituminous mats the steel roller fails to offer these benefits, although its use to a limited extent is indispensable and for these functions it is a very fine piece of equipment. As a substitute the new self-propelled pneumatic, particularly one designed for the particular conditions, seems most desirable. In due course it may be displaced by suitably designed vibration equipment; but pending this time it is an extremely useful machine. The trend to pneumatics needs to be greatly accelerated. In view of the clear logic behind its use, as well as its demonstrated effectiveness as compared to the steel roller, the change to its use should occur rapidly. In private enterprise this would not take long.

Whether or not similar speed in adopting more efficient compacting methods will be observed by our highway building agencies remains to be seen. Unquestionably the objectives of the highway engineer require consideration of the subject and prompt action thereafter.

Evidence that Bypasses Don't Hurt Community Business

Speaking before a meeting of county highway superintendents in September, John W. Johnson, New York state superintendent of public works, brought up some telling evidence against that old phantom: public anxiety lest bypasses bring economic harm to their towns.

Johnson quoted a recent editorial in a Sullivan county paper assessing the effect of the new route 17 on the village of Wurtsboro. According to the editorial, "Inquiry at the Wurtsboro bank, plus reports from leading merchants, suggest that, as far as this season is concerned, business in the village has by no means suffered from operation of the by-pass. Now that it is possible to park along Wurtsboro's main street and the hazards of a traffic jam have been eliminated, these shoppers have returned to Wurtsboro. Their return is reflected in the highest level of bank deposits recorded by the Wurtsboro office of the Sullivan County Trust Company and in a record level of sales by leading merchants."

Johnson pointed out that it is not the thru motorist who brings prosperity to an area, but the customer who returns again and again. "This customer," he said, "comes back because he is able to park and because the street where he shops is not jammed with traffic whose sole aim is to get somewhere else fast.

New Synthetic Asphalt Planned in Jamaica

A new plant which is scheduled to make a thousand tons per year of synthetic bituminous asphalt for waterproof surfacing of roads and airfields has been established in Jamaica, it was announced by the Jamaica Industrial Development Corp.

The new plant has been established by Morin Scott, formerly of the British Plasmofalt Advisory Service and United Molasses Co., Ltd., in England. This plant, third of its kind in the world engaged in the manufacture of synthetic bitumen, will also product cut backs and emulsions.

Set Up New Ohio Department On Interstate Projects

A new branch of the Ohio Department of Highways has been formed to deal especially with inter-state jobs. This is known as the Special Task Force, and is under Ralph J. Lehman, Chief Engineer of Interstate Projects.

With a staff of about 30, the group is directly responsible to the director of highways, who has charged them with supervising and coordinating all the work on all the interstate projects now being planned. Their work ends with the production of plans and the awarding of contracts for a given project.

This group has already turned over to consulting engineers the task of the Cincinnati-Conneaut Freeway segment which will extend from Columbus to the Cleveland area.

Under Chief Engineer Lehman is Robert Burket, engineer in charge of Location and Design; John Buress, engineer in charge of Right of Way; John Heier, in charge of Structures and Utilities; and Robert Meyer, Special Projects Engineer.

Mr. Burket was formerly in charge of design for the Ohio Turnpike Commission, and was with the Ohio Department of Highways for over 25 years.

North Carolina Claims Lead on Interstate Road Work

The North Carolina State Highway and Public Works Commission claims for its state the No. 1 position in miles of Interstate Highways put under contract for construction.

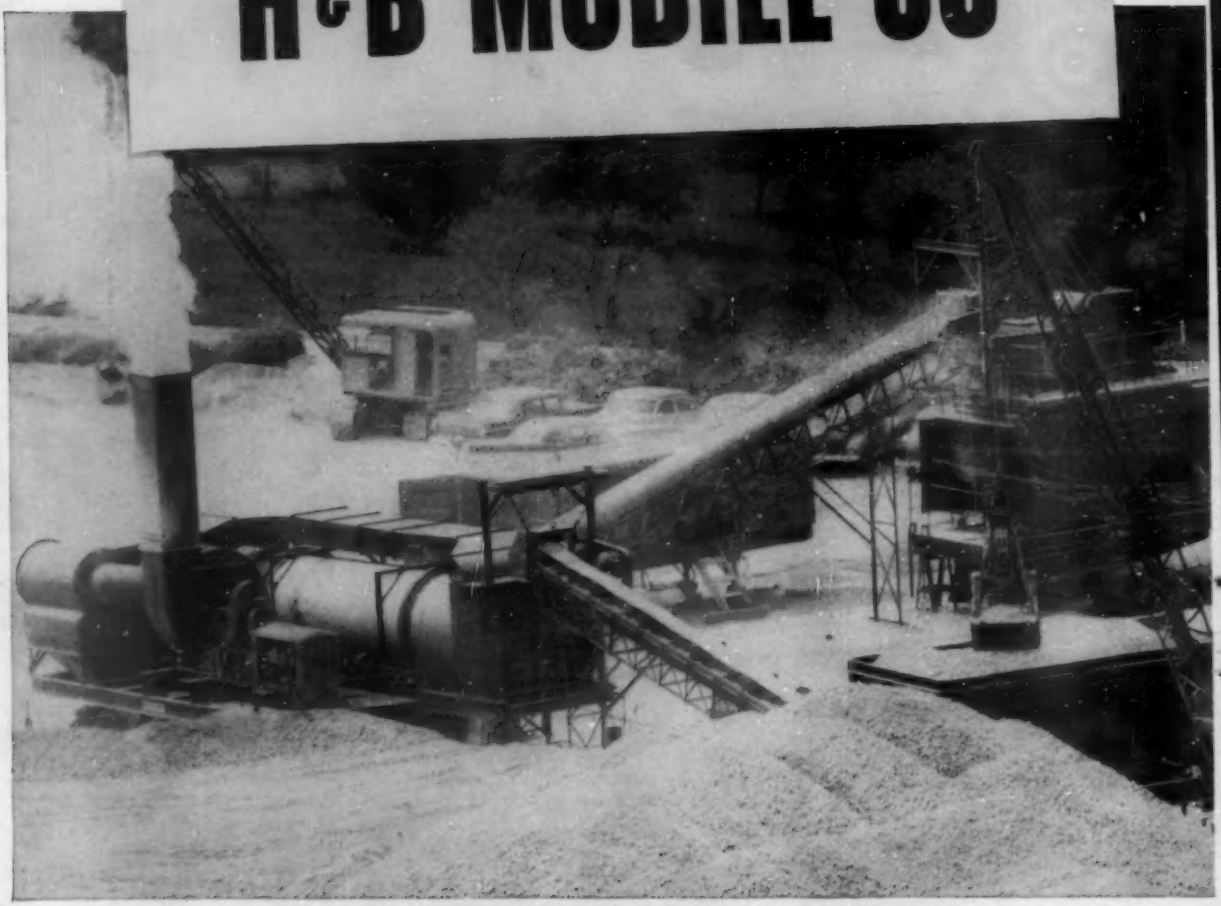
As reported by the Bureau of Public Roads, for the January-June 1957 period, the state placed 157 miles of jobs under contract. Texas is credited with being second with 150 miles.

12,000,000 Gallons Per Mile Compaction Moisture

. . . This is the rule of thumb used by the engineers of the New Mexico state highway department in estimating projects in arid country. The large grading quantities required for today's interstate arterial projects, plus the extreme dryness and high absorption of the soils of the area, make this large gallonage necessary on the average project.

Recent bidders have bid a wide range of unit prices on compaction moisture, often as part of unbalanced bids. But it is reported that at least 50 cents per thousand gallons cost is required in this area just to get the water out of the ground where wells must be drilled.

H&B MOBILE 60



ALSO—THE MOBILE 40 (100 TO 120 TPH)

These new H & B Mobile batch type asphalt plants are completely portable. They can be moved from one job to another, set up and be in operation in a minimum of time. All units are wheel mounted—no crane needed for erection or disassembly. All piping and wiring are permanently installed—with quick disconnects. The entire plant is mounted on rubber tired trailers, so that as soon as located at a set-up, with coupling connections made, it is ready to operate. All remotely located units are driven with electric motors. There are no shafts, universal joints, chains, gears, etc. Elevators, in place of conveyors, available for more compact set-up.

H & B Mobile plants meet all state specifications, and provide a most flexible set-up arrangement. Available in two sizes—M-60 (160 to 180 t.p.h.) and M-40 (100 to 120 t.p.h.). See your local H & B distributor, or write direct.

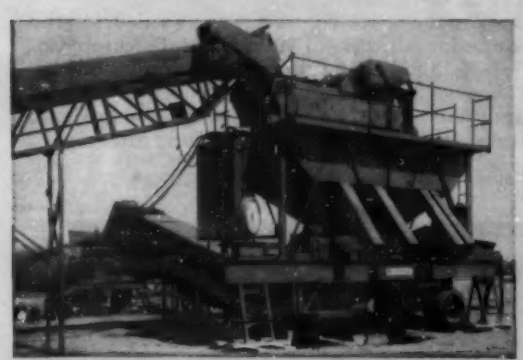
HETHERINGTON & BERNER INC.

701-745 Kentucky Avenue • Indianapolis 7, Indiana

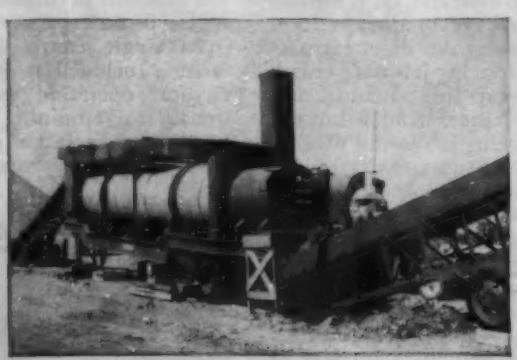
America's first builder of asphalt mixing equipment

The first completely portable batch type asphalt plant with 6,000 lb. mixer capacity!

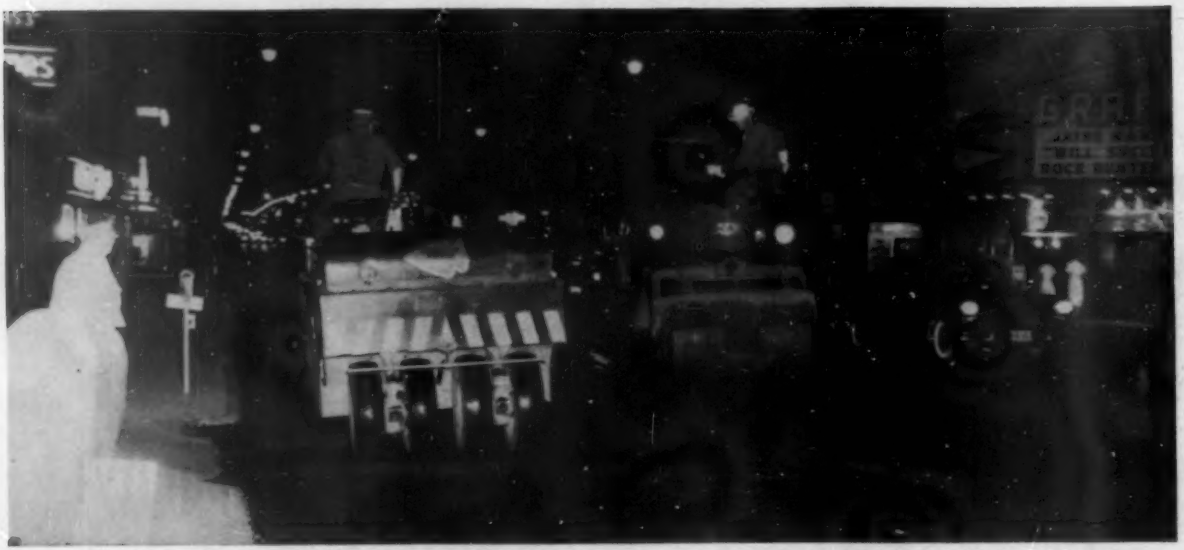
- 150 to 180 TPH
- All units wheel mounted
- No crane needed for erection
- Meets all State specifications
- All piping and wiring permanently installed—with quick disconnects
- No shafts, universal joints, chains, gears, etc.
- All remotely located units driven with electric motors
- Flexible set-up arrangement
- Complete plant—tanks, oil heater, power units, piping, etc. available from one source
- Automatic cycle control



Gradation Unit, H & B Mobile plant, showing operator's platform.



Portable Dryer Unit, H & B Mobile Plant



● Night doin's on Duluth's main street. Bros self-propelled pneumatic secured density with Buffalo-Springfield 10-ton tandem steel wheel doing the finish rolling.

Duluth's Main Street Paved at Night

Asphaltic mix placed between 6 p.m. and 6 a.m. during peak tourist season as an experiment in minimizing traffic interruption...

By H. K. Glidden

WITH ALL the tourists thronging down Superior Street, the main street of Duluth, Minn., as part of the traffic flow on U.S. 61, it seemed a shame to have to disrupt local trade by closing the street for paving. Yet a surfacing job was needed, following years of patching and spot maintenance. And a bituminous resurfacing job would need to be done during summer weather for best results.

The upshot was a decision by the Minnesota department of highways, which helps to maintain the highway through the city, to try a night paving operation. The state's specifications have always precluded placement of bituminous paving at any time except daylight hours. An experimental project seemed in order, considering the traffic advantage of performing the work during hours when traffic interruption would be at a minimum.

The feasibility of the night paving was determined following a study by the state of the city's traffic count data. The new pavement was specified to consist of 1½ in. of high-type asphaltic concrete, placed in a single course for Superior Street. Included in the job as a daytime operation was a heavier overlay for adjoining Grand Avenue. For the latter street, which had an old, worn concrete surface, a leveling and binder course were specified in addition to the surface course.

A contract was awarded for this work to Arrowhead Blacktop Co., of Duluth, with the provision that all work be completed by August 30 (except possibly the sealcoat, which was to be done after Labor

● Jackhammer crew in first operation: removing weak or above grade existing pavement.

Day).

The bid quantities included supply and placement of 400 tons of leveling course material, 50 tons of patching material, 1,213 tons of bonder mix, and 4,403 tons of surface course mix. The high-type seal coat was to be made using crushed aggregate meeting state specification FA4. The seal required an estimated 4,862 gal. of tar.

Marvin Gollinger, Arrowhead's vice president in charge of operations, elected to carry out the project taking three blocks at a time. The routing of traffic was "played by ear," allowing as much access to the street as was feasible, but resorting to detouring to adjacent streets when necessary. Traffic handling problems were met with efficiency by utilizing the off-duty service of six policemen as flagmen; these men were paid prevailing wages.

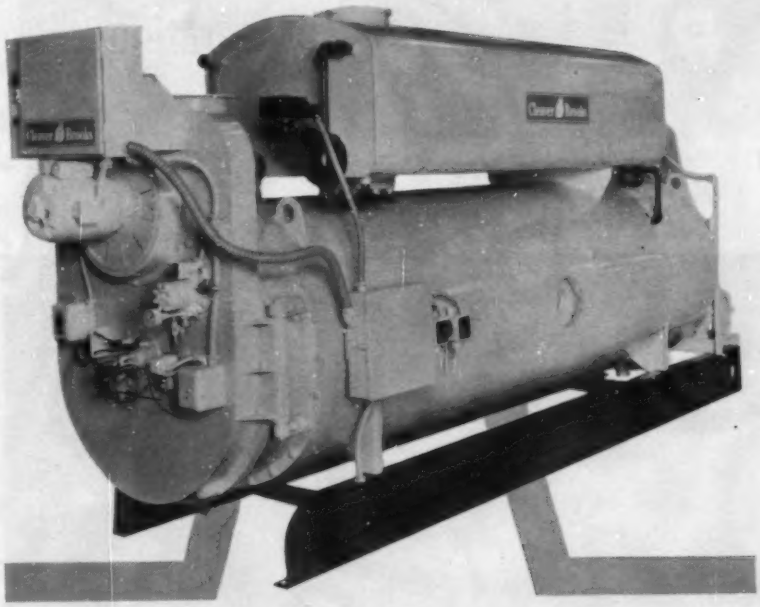
Traffic Problems

Contractor officials knew from previous experience that tourists particularly had little respect for a flagman with a flag on a stick. The uniformed men commanded and got the necessary obedience and took care of all aspects of handling traffic. During the late afternoon they attached "No Parking" signs to the parking meters in the blocks to be worked on that night. They also handled lighting and placing of flares and setting of cone-type traffic markers. Traffic volume remained high until after the first movie show let out in the late evening, keeping the patrolmen extremely busy until about 10:30 p.m.

The contractor's crew spent the first night preparing for paving activities. State inspectors during this interval chalk-marked all unsuitable areas, consisting mostly of pavement failures or areas where patching had built up the grade too high for the new surface. These areas were cut out with a jackhammer and replaced with bituminous patching material. Wherever the existing pavement was too low it was brought to a satisfactory grade by a leveling course mix spread with a motor grader. The contractor was able to complete most of this type of work during the first night.

On the second night the contractor continued patching activities and started laying of bituminous surface coarse on Superior Street. Except for the handling of traffic, there was little difference between

NEW Forced circulation Peak-Temp oil heater



Speeds heating of asphalt

Forced circulation of heat transfer oils assures uniform heat distribution . . . improved heat transfer, without "hot spots" or coking. Built-in impeller circulates heat transfer oil at 8 ft. per second, maintains constant oil flow across the furnace and tubes.

Other design advantages:

- **Heat transfer oil lasts indefinitely because hot oil is in minimum contact with air.**
- **No pressure or water problems. Operates at atmospheric pressure; heats and circulates efficient heat transfer oils at temperatures up to 450° F.**
- **Automatic in operation, fully protected with safety controls; quiet, smokeless.**

Cash in on its versatility. Use the new Peak-Temp oil heater for high temperatures, low pressure heating at asphalt land or marine terminals, pre-stressed concrete plants . . . wherever trouble-free controlled heating or curing of materials is required. For complete details write Cleaver-Brooks Company, Road Machinery Div., Dept. M, 395 E. Keefe Ave., Milwaukee 12, Wis.

Cleaver Brooks®

ORIGINATORS OF THE SELF CONTAINED BOILER

SELF-CONTAINED BOILERS — 15 to 600 hp. Oil, gas and combination fired.

PORTABLE STEAMERS — 50 to 125 hp. High capacity, multi-duty.

PEAK-TEMP OIL HEATERS — Heat to 450 F. at low pressure.

PORTABLE PUMPING BOOSTERS — Heat and pump bituminous materials.

. . . for more details circle 252 on enclosed return postal card

Steps in Night Paving Operation

1. **Hot-mix for patching and correcting contour grade was truck dumped. Marvin Gollinger, white shirted on right, supervised operations for contractor.**

2. **Spreading hot-mix for contour grading, done with Pettibone Speed Grader.**

this night operation and ordinary daylight paving. A thin tack coat was hand-sprayed over the existing pavement. Then the Barber-Greene paver started down one side of the street, allowing traffic to use the other side, and turned around to lay successive lanes. By 6 a.m. quitting time the surfacing had been placed and rolled for the full three blocks.

Superior Street is well lighted and this made it quite easy to carry out the night's work without supplementary floodlighting. It was necessary for the paving operator to watch the depth of the spread very carefully, particularly to accomplish a uniform joint between lanes of pavement. Rolling proved to be largely routine with little difference from that which would be experienced on a cloudy, low-temperature summer day.

One noteworthy phase of the operation was the fact that there were a good many manholes, catch basins and utility company installations which had to be raised to the new pavement grade. The practice was adopted of paving right over the top of these structures after their location had been carefully referenced to the centerline of pavement. As a preliminary measure, any castings or fittings which were set in concrete or otherwise quite permanently installed, were jackhammered loose prior to the paving but left in place. After the paving was completed, the contractor came back and cut out the new pavement surrounding the structures, raised the structures to the proper grade and poured Portland cement concrete around them to within 2 in. of grade. After concrete had set, the 2 in. was filled with bituminous paving to grade.

Breakdown rolling was accomplished by a Buffalo-Springfield 10-ton 3-wheel roller. A Bros self-propelled pneumatic roller then took over for compaction. An Essick tandem steel wheel 5-ton roller was used to roll small patches. A Bros self-propelled pneumatic roller was used between initial and final rolling. A Buffalo-Springfield tandem 10-ton roller rolled the heavier patching and leveling course material and then served as finishing roller on the finished pavement. A Bros 1,250-gal. distributor on a FWD truck, using an Erickson air-controlled 12 ft. spray bar, was on hand for tack coating, and was subsequently used for seal coating.

As far as labor and operators were concerned, the contractor used his regular black top crews. In this case they were simply working nights instead of days. The contractor hired most of his batch trucks, however, employing one or two of his own in the string as pace setters.

3. **Hot-mix patching and hard-to-reach spots were rolled with Essick 5-ton tandem steel wheel roller.**

Disadvantages

One disadvantage of the early evening operation was the fact that traffic was heavy and slow-moving along the 14 miles of highway between the hot-mix plant and the job. This circumstance slowed delivery of mix and tended to make the paver progress irregular at times.

On the other hand, traffic thinned out after 11 p.m. to a point where the hauling was carried out in a very orderly manner. "The operation averaged out about the same as on daytime production," noted Gollinger, who commented that a night-time job of a few days' duration was hard on the crew. The men didn't have time to adjust their sleeping habits and hence showed

(Continued on page 159)

ADEQUATE SHOULDERS: Key to greater highway safety and service

BITUMULS® DM-1 is applied by distributor.

BITUMULS Base Stabilization of Shoulders on New Jersey Route S-41

FIRST PULVI-MIXER follows closely behind distributor.

PNEUMATIC ROLLERS in tandem on initial compaction.

MC-1 CUTBACK PRIME applied ahead of final seal.

● Typical of the speed and ease with which new safety and service can be built into existing highways is the work done last August along an eight mile stretch of Highway Route S-41, near Ellisburg, N. J.

Along each side of the 20 foot, rigid type pavement, a 10 foot width of sand-gravel base, 4 inches deep, had previously been placed and compacted to provide drainage. But it lacked stability, both under moving traffic and parked vehicles.

CONSTRUCTION METHOD

This in-place material was scarified, then bladed level. Over the loose scarified material, Bitumuls DM-1 was applied in two applications. Following each application, the material was mixed with two Pulvi-Mixers operating in tandem.

After mixing, the material was cut back to an even sub-grade line, then re-spread uniformly over the full 10 foot width. During blading and spreading, the mix had aerated sufficiently to allow immediate compaction. Pneumatic-tire rollers were used for initial compaction, with a final pass by tandem steel-wheel rollers.

This stabilized base was allowed to cure for one week, then surfacing proceeded as follows:

MC-1 cutback prime applied at the rate of 0.25 gal. per sq. yd. ⅜" traprock applied over prime at the rate of 25 lbs. per sq. yd. Bitumuls RS-2 applied at the rate of 0.25 gal. per sq. yd. ⅜" traprock again applied at the rate of 25 lbs. per sq. yd.

The shoulders were then thoroughly rolled.

In addition to holding costs to a minimum by making use of in-place material, Bitumuls Base Stabilization provides a fast, simple method of extending the service and safety of existing highways. *Full details on this method of shoulder construction are available from our office nearest you.*

American Bitumuls & Asphalt Company

200 Bush St., San Francisco 20, Calif. — Perth Amboy, N.J.
Baltimore 3, Md. — St. Louis 17, Mo. — Cincinnati 38, Ohio
Mobile, Ala. — San Juan 23, P.R. — Tucson, Ariz.
Inglewood, Calif. — Oakland 1, Calif. — Portland 7, Ore.

. . . for more details circle 235 on enclosed return postal card

Look at the uniform triple-lap coverage and straight edges you get with a "Black-Topper"

You can see the results of Etnyre's exclusive triple-lap coverage (spray from each nozzle overlapping *two* other sprays) in the unretouched photograph above. Road builders have learned that single lap coverage is utterly unsatisfactory . . . double lap coverage somewhat better . . . but triple lap coverage is the complete answer to hitting rough aggregate from all possible angles for complete coverage.

Moreover, by turning the end nozzle as indicated, you get a sharp line edge which adds the finishing touch to the job. With this accurate alignment, you can spray right up to the edge of curbs. Such dependable operation and uniform, accurate distribution are typical results you can expect from an Etnyre. Investigate today —find out how soon a "Black Topper" can be delivered to you to handle your work faster, better, more economically!

E. D. Etnyre & Co., Oregon, Illinois

SEE YOUR ETNYRE DEALER

ETNYRE

"Black-Topper"

BITUMINOUS DISTRIBUTORS

. . . for more details circle 257 on enclosed return postal card

Duluth Main Street

(Continued from page 156)

the strain in the second night. They were glad to find out that they wouldn't work the third successive night.

The first night's run was 800 tons of asphaltic mix. The second night, 16 batch trucks hauled 1,000 tons. The operating schedule called for starting the hot-mix plant at 6 p.m., which put trucks on the job at 7 p.m. The plant was stopped at 5 a.m., allowing the crews to get off the street at 6 a.m. The first two nights brought the job up to Sunday. Sunday night, after a Saturday night rest, work was carried on from midnight to 6 a.m. And the same late start was made Monday night, which is a downtown shopper's night. The entire mile of 56-ft. pavement on Superior Street was placed in these four nights.

The traffic problem on Grand Avenue was less severe, and this street was paved on schedule as a daylight operation.

A possible threat to the success of this project was the chance of a sudden turn of weather (Duluth has weather extremes). But weather luck held.

The comments expressed on the feasibility of night paving following this job were all good. Gollinger stated that his operations ran smoothly and there was little difference in the cost as compared to daylight work. Lester Miller, district engineer for the Minnesota department of highways, expressed complete satisfaction with the job. A careful inspection of the surface smoothness showed it to be up to state standards.

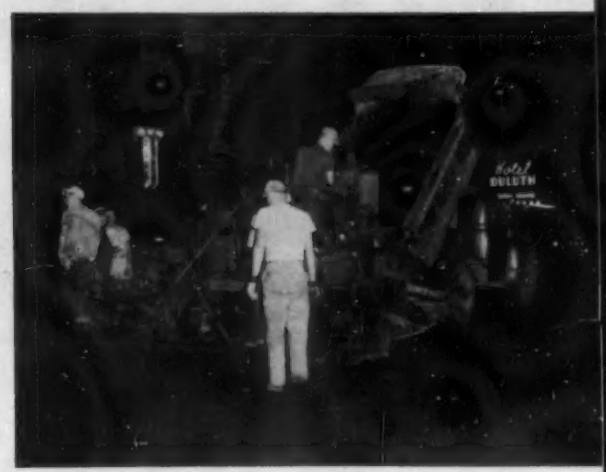
The success of this operation may bring changes as far as this type of operation under heavy traffic is concerned. There is indication that from now on night paving will be permitted under controlled conditions.

For the Minnesota highway department V. E. Kempf was project engineer working out of the district office of Lester Miller.

It is not unusual to find two-way radio communication on construction projects nowadays. However, it was somewhat unusual to find Gollinger's station wagon equipped by the Bell Telephone Company so that he can carry on phone conversations while driving anywhere in the Duluth area. This is a service which Gollinger says costs about $50 a month including a number of long distance calls which he can also handle from his car. The contractor keeps this remote telephone installation in the car during the six active months of the season. The re-installation cost in the spring runs $10. A two-position switch controls either the ringing of a telephone bell in the car or the sounding of the car horn. If Gollinger is away from the car the switch can be put in a position whereby instead of ringing a bell the telephone sounds his horn. Gollinger praised this service highly. It makes him available under all working conditions.

Arrowhead Blacktop Co. is a Duluth firm confining their operations to a radius of about 40 miles from Duluth. Their crusher and

4. Existing pavement was given light hand-applied tack coat using Bros 1,250 gal. distributor on FWD truck.



5. Barber-Greene spreader working in the after-midnight hours.

SWENSON SPREADERS
FOR ICE CONTROL

SPREADS SALT 200 LBS. PER MILE
OR IN ANY DESIRED AMOUNT
Lays a Narrow Strip or Full Traffic Lane

Handles all granular materials — salt, cinders, sand, calcium chloride, rock chips. Spreads at speeds up to 30 M.P.H. Clutch-controlled flow: steady or intermittent for hills and intersections.

Write for complete information

SWENSON SPREADER & MFG. CO.
LINDENWOOD, ILLINOIS

. . . for more details circle 295 on enclosed return postal card

from 30 T.P.H. to 250 T.P.H.*

...there's a

MADSEN
ASPHALT PLANT
for every job...every budget

If you're in the asphalt producing business — whatever your requirements are — there's a MADSEN Asphalt Plant to handle your particular needs. MADSEN Plants are built in capacities from 1000 lbs. to 6000 lbs. per batch. They are known for their high production, simple, fast operation, low maintenance costs and long-lived performance. The down-to-earth ability to make more money on every asphalt mixing job enables MADSEN owners to bid advantageously on today's asphalt paving jobs and to show a greater return on their investment. Plan now to put a MADSEN Asphalt Plant to work . . . see your MADSEN Distributor.

* These are rated capacities. With the big MADSEN 6000 lb. Plants owner claims are near the 300 T.P.H. mark.

THE LITTLE MONSTER®
This complete asphalt mixing plant on wheels is designed for fast moving, fast set-up and substantial daily production.
Plant shown, owned by a State Highway Department is complete including two MADSEN 32" x 10' Dryers, a MADSEN 2-compartment portable feed bunker and dual cold stone elevators. Mixer unloading skip . . . loads asphalt into trucks. Plant is rated at 30 T.P.H. on a one minute mixing cycle.

MADSEN 2000-LB. SPECIAL ASPHALT PLANT
A small plant with big plant features. The 2000-lb. SPECIAL is ideal for the not-too-large contractor, the municipality and the large contractor who wants a small type of operation for producing approximately 480 tons per 8-hour day. It's an ideal plant for handling those jobs up to the 10,000-ton class.

MADSEN MODEL 481 ASPHALT PLANT
This outstanding MADSEN plant is available in 4000-lb., 5000-lb. and 6000-lb. batch capacities. It is designed for the ultimate in portability. Incorporates many MADSEN "firsts" that speed production and reduce maintenance costs. The 481 may be purchased as a 4000-lb. plant and converted to a 5000-lb. or 6000-lb. plant with only minor modification costs.

For information on the MADSEN Asphalt Plants shown above, the MADSEN 3000-lb. Plant or the new MADSEN "HOT ROD" Asphalt Plant . . . (available in 3000-lb., 4000-lb. and 5000-lb. capacities) . . . ask your MADSEN Distributor or write MADSEN WORKS, Baldwin-Lima-Hamilton Corporation, P.O. Box 38, La Mirada, California

MADSEN Equipment that Serves

THE MADSEN LINE OF PRODUCTS
FOR THE ASPHALT PAVING INDUSTRY
ASPHALT PAVING PLANTS • POG MILL MIXERS • AGGREGATE DRYERS • DUST COLLECTOR UNITS
ROAD POG TRAVEL-MIX PLANTS • WEIGH BATCHERS • SUPER FLOAT AND JOHNSON FLOAT FINISHERS
ASPHALT TANKS • ROYAL CROWN PUMP VALVES • ASPHALT AND FUEL PUMP UNITS

BALDWIN BLH LIMA-HAMILTON

MADSEN WORKS
BALDWIN-LIMA-HAMILTON
CONSTRUCTION EQUIPMENT DIVISION
DIVISIONS: Austin-Western • Eddystone • Electronics & Instrumentation • Hamilton • Lima • Loewy-Hydropress • Madsen • Pelton • Standard Steel Works

. . . for more details circle 281 on enclosed return postal card

hot-mix plant is set up just off Highway 23 south of Duluth in a large basalt rock formation. Quarry and crusher operations are geared to producing about 70 tons per hour. The crusher consists of a Universal 30 x 42 primary crusher, Universal conveyors, an Allis-Chalmers 5 x 14 riffleflow screen and a Kennedy Van Saun gyratory secondary crusher. The hot-mix plant can be considered hybrid in that Gollinger put it together using a great variety of parts. It is a batch-type plant also geared to produce roughly 70 tons per hour.

6. Buffalo-Springfield 3-wheel 10-ton steel wheel kept close behind spreader on breakdown rolling.

7. Seen here is one of the six uniformed off-duty patrolmen hired by the contractor to control heavy early-evening traffic.

● Contractor used 2 GMC 550 Hydra-Matic trucks from quarry.

Good Advice on the Selection of Lubricants

From Gulf Contractors' Guide, published by the Gulf Oil Corporation. Reproduced by permission.

THE CURRENT trend in earthmoving and allied equipment is to larger and larger units with more power and operating at higher speeds. These developments impose greater and greater demands on fuels and lubricants.

Such equipment also represents a very large capital investment* and must, therefore, operate as many hours as possible to avoid prohibitive overhead costs. Repair parts are extremely costly and excessive down-time for repairs or overhaul is ruinous. Therefore the use of high quality fuels and lubricants and efficient maintenance play tremendously important roles and they must go hand in hand.

It is no longer necessary to point out the obvious fallacy of endeavoring to save a few cents a gallon by purchasing inferior products, or of using lubricants beyond their reasonable service life. It is also unnecessary to emphasize that constant adherence to a good maintenance program is essential. Instead we shall attempt to point out the types of products best suited for the various applications and explain the maintenance practices which should be observed in order to secure maximum service from them.

In an industrial plant a wide variety of oils and greases may be selected, each of which is ideally suited to the particular application for which it is chosen. Highway specialized lubricants may be selected for critical applications, while less expensive products may satisfy others of a less exacting nature. A lubrication program can then be organized to assure that the proper lubricant is applied to each point, resulting in the best possible lubrication at the lowest possible over-all cost.

Due to the nature of most contracting operations such an approach is not practical. Experience has proven that a multiplicity of lubricants lead to confusion and misapplication for numerous reasons readily apparent to those familiar with this business.

Fortunately technical advances in the petroleum industry have resulted in the development of improved lubricating oils and greases capable of broad application under a variety of operating conditions. Among these are multi-purpose greases and multi-purpose gear oils, as well as certain high-additive crankcase oils. By correctly applying such products to the equipment on a job the entire lubrication problem may be simplified—sometimes to the point where only one crankcase oil, one gear oil and one grease are necessary. The consequent reductions in inventory, lubrication equipment and time are apparent.

*Tractors—up to $50,000 each. Scrapers $80,000-$70,000. Haulage units $15,000-$90,000.

● Although quicksand surrounds the tunnel, work progresses safely and efficiently inside.

Tunnelers Put Outfall Under Canadian 4-Lane Highway

● Power winch hoisted muck to the surface. Then the muck was rolled on I-beam rail to dumping spot.

Traffic delay was avoided with help of steel lined plates which permitted tunneling through soupy soil without disturbing the pavement foundation.

Pictured here is a tunneling operation which made it unnecessary to cut through a busy 4-lane highway pavement and interrupt traffic, while an outfall sewer was installed.

The location was a point on Queen Elizabeth Way, the expressway running between Niagara Falls and Toronto, Ontario. A drainage project near Niagara Falls required a 6-ft.-diameter outfall line to pass under the highway.

In considering a solution, the engineers quickly ascertained that an open trench installation was out of the question, because of the danger and inconvenience to traffic while work was in progress. Tunneling was seen to be the only feasible answer.

Although tunneling usually presents few difficulties, soupy working conditions on nearby sections of the drainage line indicated that this would be no normal tunnel job. The contractor began by sinking a shaft in the center mail of the highway. From there the tunnel was driven in two directions, first, under the northbound lanes, then the southbound.

As was expected, the tunneling crew ran into quicksand as well as firm soil. Through the firm soil, advances as much as 6 ft. per shift were recorded, while 18 in. daily progress per shift was considered good through the quicksand. However, since the entire 8-foot-diameter tunnel was dug and mucked out by hand, these speeds were considered good.

As the tunneling progressed, Armco Tunnel Liner Plates were bolted in place to protect the workmen and prevent cave-ins. Each time the digging advanced 18 in., an 8-ft.-diameter ring of liner plates was bolted to the preceding ring.

The 8-gage plates weighing about 49 lb. each, were easily installed by hand. At the face of the tunnel, two men lifted and positioned the plates. Bolts projecting from the lining already in place fit into holes in the next plate. At soon as the

● Valve controls fluid to hydraulically operated rams. The rams push metal shield forward with 2,000 psi pressure.

plates were in place, a third man placed and tightened the nuts. The longitudinal lapped joints of adjacent rings were staggered for greater strength. As each new ring was completed digging was resumed at the face of the tunnel.

• *Shield Covers Face.* In quicksand the tunnelers used a metal shield that covered the face of the tunnel. Hydraulically operated rams were attached to the tunnel liner already in place to push the shield forward through the quicksand. A sluice gate near the bottom of the shield was opened to let the loose sand ooze into the tunnel. Then the gate was closed while mucking crews removed the sand.

When the shield was advanced 18 in. another ring of liner plates was bolted in place within the protection of the shield, and the rams were moved forward to the next ring of plates.

An ordinary farm litter bucket on an overhead monorail speeded muck removal. The rail hangers hooked into holes in the flanges of the liner plate near the crown of the tunnel. A 50-ft. high tubular scaffolding with a pulley arrangement on top was built in the access shaft to help move materials to the top. An electric-powered winch raised the loaded buckets.

Through the use of the foregoing methods a tunnel provides a safe, economical solution to difficult under-pavement conduit crossings. On this job there was no convenient detour route. There was too much traffic to close one lane at a time for an open trench. But with tunneling, all work was underground with no surface interruptions. And there were no costly pavement repairs afterward.

Proven Workhorse!

TAMPO'S DEPENDABLE SP-9S

- NO MAINTENANCE DOWN-TIME
- COMPLETE VISIBILITY ALL AROUND
- STABLE ACROSS THE DRIVING WHEELS
- ECONOMICAL AND EASY ON FUEL

72 inch rolling width. Automotive power steering. Optional equipment available for every job — asphaltic mat, seal coat, chips, water bound base, soil cement. Write for latest bulletins.

TAMPO MANUFACTURING COMPANY

DEPT. 2 • P. O. BOX 2340 • 1146 W. LAUREL ST.

SAN ANTONIO, TEXAS • PHONE: PE-3-9171

. . . for more details circle 296 on enclosed return postal card

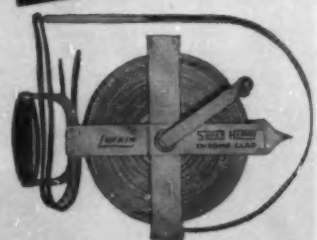
WHY SUPER HI-WAY Drag Tapes last longer

LUFKIN

SUPER HI-WAY

DRAG TAPE

EASY TO READ MARKINGS



Extra heavy tape steel is etched away to leave full strength line with markings raised in bold relief. Raised protective edges and jet black background provide long wear and make markings easy to read. Chrome Clad finish resists rust and corrosion, won't chip, crack or peel. Each foot marked — end feet graduated to 100ths ft. 100 - 200 - 300 foot lengths.

BUY LUFKIN

TAPES • RULES

PRECISION TOOLS

FROM YOUR SUPPLY STORE

THE LUFKIN RULE COMPANY

Saginaw, Michigan

BETTER MEASURE WITH LUFKIN

398

. . . for more details circle 279 on enclosed return postal card

● A pair of retired produce trailers—now comfortable, good-looking (and money saving) field buildings for an enterprising contractor.

Contractor Converts Old Trailers Into

Portable Office and Tool House

CONTRACTORS on highway and heavy projects often show ingenuity in rigging up portable office and storage space at job sites. As an example: the solution found by the California firm, MacDonald, Young and Nelson of San Francisco. It uses the "boxes" from second-hand Fruehauf trailers.

The firm used to build its own portable offices and tool sheds at a cost of some $500 to $800 each. But experience demonstrated that these structures, though well built of wood, would not hold up beyond three or four jobs. The stresses of being jacked up and moved from job to job soon loosened joints to the extent that the portable buildings became useless.

MacDonald, Young and Nelson now have 15 converted trailer boxes which are used on jobs in California and Nevada. They figure the cost of these units at under $500 apiece, and they find that these units are practically indestructible.

Frank Stearns, the foreman, suggests other contractors who are thinking about trying trailer boxes for offices should specify equipment that was refrigerated when used as a highway hauler. "These old refrigerated trailers," says Stearns, "are well insulated and hence minimize air conditioning problems in both summer and winter. We purchased ours from the used trailer sales branch of Fruehauf Trailer Company in Oakland and have been very satisfied with them. Painted with colors, they are attractive and have good advertising value, too."

In operation, the boxes are lifted to the deck of a flatbed trailer, either by fork lifts or hydraulic jacks. If the construction job is to be a long-term project, the trailers are then placed on the ground at the site for semi-permanent installation; should the job be short-term, the trailer boxes are left on the flatbed.

Conversion of the trailer boxes to portable offices is simply a matter of installing windows, flooring and wiring. Use as tool sheds require little or no conversion. The company which used to build 10 or 15 wooden units yearly figures it is saving about $4,000 per year by converting the old over-road haulers.

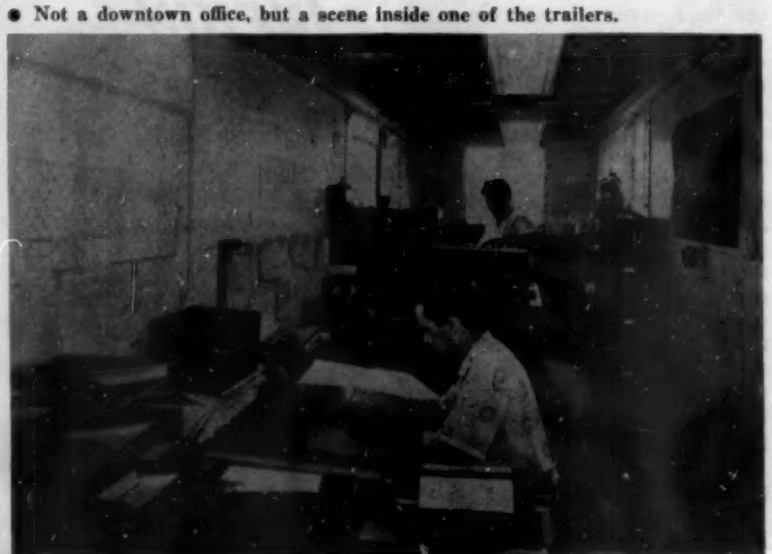
Largest Sign Bridge Now In Service at Camden

An aluminum sign bridge said to be the largest and longest span ever built, and previewing the kind of sign support likely to be seen on many interstate installations, is now in service on the approach to the Walt Whitman Bridge between Philadelphia and Camden.

Measuring 140′ 8″ in span, the bridge envelopes 16 traffic lanes, two road shoulders and a concrete divider. It is located near the toll plaza at the Camden approach.

The bridge was manufactured of tubular aluminum by Pfaff and Kendall and Traffic and Street Signs Co. and has a weight of 16,000 lb. It spans the roadway known as the North-South Freeway near the bridge.

● Not a downtown office, but a scene inside one of the trailers.



Manufacturers' Literature

TYPE ILH BALLASTS FOR MERCURY-LAMP STREET LIGHTING. Bulletin GEC 1467, provides technical data on mercury lamp operation, voltage dips constant-current transformer considerations, fusing, crest factor and regulator ballasts; discusses applications for various types of ILH ballasts, lists features of ballasts and accessories and includes pricing information.

For more details circle 152 on Enclosed Return Postal Card.

LIFT TRUCK BULLETIN BV-334A. Buda Division, Allis-Chalmers Manufacturing Co., Milwaukee, Wis. Engineering, design and construction features of new FT-100 lift truck. Specifications cover 10,000-lb. lift truck and 230-cu. in. Allis-Chalmers engine.

For more details circle 153 on Enclosed Return Postal Card.

ELECTRIC PREHEATERS FOR ENGINES. Kim Hotstart Mfg. Co., West 917 Broadway, Spokane 1, Wash. Maintenance manual on electric preheaters for gasoline and diesel engines. 12-page manual deals with regular inspection and servicing of Kim units and outlines program of preventive maintenance.

For more details circle 154 on Enclosed Return Postal Card.

WHITE PRINT MATERIALS. Ozalid Division, General Aniline and Film Corp., 5 Corliss Lane, Johnson City, N. Y. New bulletin describing advantages of using sensitized intermediate white print materials. Suggests how intermediate materials will cut drafting time, speed design changes, safeguard valuable originals, and make complete prints.

For more details circle 155 on Enclosed Return Postal Card.

DIESEL ENGINES. Bulletin 110. White Diesel Engine Division, The White Motor Co., Springfield, Ohio. 12-page bulletin on Models 60 and 80 Superior stationary diesels. Includes illustrated construction features, dimension data, performance curves and specifications.

For more details circle 156 on Enclosed Return Postal Card.

PORTABLE PRIMARY CRUSHING PLANTS. Lipmann Engineering Works, Inc., 4603 West Mitchell St., Milwaukee 14, Wis. Brochure on new "Mohawk" plant, containing specifications and details on the four sizes.

For more details circle 157 on Enclosed Return Postal Card.

MASONRY SAWS. Eveready Brikson Co., 1509 S. Michigan Blvd., Dept. 650, Chicago 5, Ill. Two circulars, one covering the completely new 2 hp "Briksawmatic" and standard "Briksaw," the other showing prices on all Eveready Equipment and blades and a masonry blade recommendation chart for cutting all masonry materials.

For more details circle 158 on Enclosed Return Postal Card.

INDUSTRIAL TIRES. B. F. Goodrich Tire Co., Akron, Ohio. 36-page illustrated guide book explaining all phases of industrial tire use, specifications for all types of tires. Complete B. F. Goodrich line is described in detail as well as the use of each type.

For more details circle 159 on Enclosed Return Postal Card.

CRANE-EXCAVATOR Bulletin TCR-202, Schield Bantam Co., 999 Park St., Waverly, Iowa.—6-page bulletin on Batam model T-35 Crane-Excavator. Features applications and data on 7 and 8-ton carrier-mounted machines. Charts and illustrations give dimensions and operating data.

For more details circle 160 on Enclosed Return Postal Card.

HOW TO USE STEEL SHORING AND SCAFFOLDING IN HIGHWAY CONSTRUCTION is a new highway bulletin released by The Patent Scaffolding Co., Inc. Illustrated with typical job applications, this booklet details cost-cutting ways to use this equipment for road building. Included are engineering layouts and instructions on obtaining them. For free copy, ask for Bulletin G208 by writing to The Patent Scaffolding Co., Inc., 38-21 - 12th St., Long Island City 1, N. Y.

For more details circle 161 on Enclosed Return Postal Card.

MORTON SALT COMPANY has issued a new technical pamphlet titled *Morton Salt Stabilized Road Bases* which discusses the advantages of salt-soil stabilized roads as opposed to loose aggregate roads, and details the steps necessary in salt stabilizing a road. The booklet is available on request from the Morton Salt Company, 120 S. La-Salle St., Chicago 3, Ill.

For more details circle 162 on Enclosed Return Postal Card.

MOTOR SCRAPER. MS-1226. Construction Equipment Division, Allis-Chalmers Mfg. Co., P. O. Box 512, Milwaukee 1, Wis. Performance and design features of new T5-160 7 cu. yd. 155 hp motor scraper. Photographs, illustrations and specifications tell new model's design and construction features.

For more details circle 163 on Enclosed Return Postal Card.

(Continued on page 170)

New Rotary Tiller Mounts on I. H. Farmall Cub - Lo Boy Tractors

The first rotary tiller attachment ever offered to owners of International Harvester Farmall Cub and Cub Lo-Boy tractors has been introduced by the Howard Rotavator Co. The model L28 Howard Rotavator mounts on the tractor fast hitch, power to the rotor being supplied by a Blood Bros. universal drive taken from the tractor power take-off.

The Rotavator tills a swath 28 in. wide, being offset to the right so that the right hand tractor wheel track is obliterated during tilling. The rotor is equipped with 24 self-sharpening hoe-like blades, of the type which have been successful on the other models of this line. Larger models can have this attachment supplied for soil stabilizing work.

here . . . without a doubt . . . is the most useful buying catalog in your office

. . . and here are some reasons why you should be USING IT DAILY!

- Catalogs are PREFILED — Saving you time and space required to file individual manufacturers' catalogs.
- Saves you the time and inconvenience of writing to manufacturers for catalogs.
- Gives you all the facts needed BEFORE you make a buying decision.
- Manufacturers' names and trade names indexed alphabetically for quick reference to individual catalogs.
- All the buying information is 'boiled down' — designed for your convenience.

After checking the advantages listed above, you can see why this ONE CATALOG offers you so MANY advantages . . . saving you both time and money, not only in the mechanical and physical aspects of a cataloging operation . . . BUT MOST IMPORTANT OF ALL . . . it is available WHEN you NEED it . . . BEFORE you make your buying decisions! The manufacturers represented in this catalog are literally 'meeting' with you in your office — offering you all the information you could possibly need concerning their products. Why not meet them at least half way — and USE THEIR PREFILED INFORMATION!

Here are the manufacturers represented in Gillette's Heavy Construction Prefiled Catalog:

Acker Drill Company, Inc.
American-Marietta Company
American Steel & Wire
Anthony Company
Armco Drainage & Metal Products, Inc.
Arrow Manufacturing Company
Austin-Western
Baldwin-Lima-Hamilton Corp.
Barber-Greene Company
Blaw-Knox Company
Briscoe Manufacturers of California
Bros Boiler & Mfg. Company, Wm.
Buffalo-Springfield Roller Company
Butler Bin Company
Carey Manufacturing Company, The Philip
Childers Manufacturing Company, Inc.
Chrysler Corporation
Clark Equipment Company
Cleaver-Brooks Company
Cleveland Formgrader Company, The
Cleveland Trencher Company, The
Colorado Fuel and Iron Corp., The
Concrete Saving Equipment, Inc.
Construction Products Sales
Continental Motors Corporation
Cummer & Son Co., The F. D.
Cummins Engine Company, Inc.
Detroit Diesel Engine Division
Dart Manufacturing & Sales Co.
Erie Strayer Company
Flexible Road Joint Machine Company, The
Flinkote Company, The
Gar-Bro Manufacturing Company
General Motors Corporation
Gledhill Road Machinery Company, The
Goodall Rubber Company
Gunderson-Taylor Machinery Company
Harnischfeger
Heil Company, The
Holtzel Steel Form & Iron Company, The
Hensley Equipment Company, Inc.
Hough Co., The Frank G.
Huber Worco Company
Ingersoll-Rand
International Harvester Company
Jackson Vibrators, Inc.
Jay Manufacturing Company
Madsen Works
Mid-Western Industries, Inc.
Miller Tilt-Top Trailer Company
Minneapolis-Moline
Naugatuck Chemical
Owen Bucket Company, The
Pacific Car and Foundry Company
Phoenix Products Company
Pioneer Engineering Works, Inc.
Pippin Construction Equipment, Inc.
Presstite-Keystone Company
Republic Steel Corporation
Rogers Brothers Corporation
Seaman-Andwall Corporation
Seaman-Gunnison Corporation
Servicised Products Corporation
Shawnee Manufacturing Company, Inc.
Stow Manufacturing Company
Symons Clamp & Mfg. Company
Timken Roller Bearing Company, The
Toncan Culvert Manufacturers Association
Tampo Manufacturing Company
United States Motors Corporation
United States Rubber Company
United States Steel
United Steel Fabricators, Inc.
Viber Company
Waukesha Motor Company
White Instrument Company, David
Wickwire Spencer Steel Division
Wico Electric Company
Williams Form Engineering Corporation

Personnel Problems

Survey Rates Attitudes of Engineers Toward Their Jobs

Engineers must change their attitudes if they are to become good managers. Opportunity for advancement and the chance to do creative work are rated as the most important job factors by engineers in industry.

Three-fourths of the engineers in industry feel their education was deficient in certain areas.

These are highlights in a survey on "Career Satisfactions of Professional Engineers in Industry" presented at a conference on professional development of young engineers held at the recent annual meeting of the National Society of Professional Engineers in Dallas, Texas.

The survey is the latest in a series of executive research reports made under the sponsorship of the Professional Engineers Conference Board for Industry, in cooperation with the above society. Conducted by the Opinion Research Corporation, Princeton, N. J., the report is based on personal interviews with 265 professional engineers employed in industry throughout the country. While not covering the roadbuilding field as such, the survey's findings are considered of interest to highway civil engineers. The detailed "depth" interviews were designed to bring out the non-salary career satisfactions of engineers at three stages of professional experience—3 to 6 years, 10 to 15 years and 20 to 25 years.

The survey questions centered around such things as the engineer outside of his work, the career outlook of professional engineers, satisfaction and frustration on the job, the question of professional status, and the differences in values of the more successful engineers.

The survey indicated that the engineers in the company hierarchy view themselves as superior to the accounting, personnel, public relations and advertising branches. However, appreciable numbers feel that the engineer is accorded less importance than the production and sales departments.

Topping the list of company-sponsored training courses that the engineers said would be most profitable to them were: organization and planning, how to supervise, and how to handle people.

The survey found that well over half of the engineers in all three experience-level groups think that engineering is not recognized as a profession by the general public.

The survey also found that the most skepticism about the opportunities for advancement in engineering was expressed by men in the lowest technical positions. The engineers interviewed for the survey indicated that sheer technical competence does not receive the same tangible rewards for successful performance that are available in other positions.

Eleven companies, each among the 200 largest corporations in the United States, were represented in the survey. The industries covered were: aircraft, automobile manufacturing, chemical, electronics, electrical machinery, heavy equipment, petroleum refining, and rubber.

Comptroller General's Decision on Wage Rates

In Comp. Gen. Dec. B-129205, 9 5-57, the General Accounting Office noted that the Labor Department's correction of inadvertent error in prevailing Davis-Bacon wage rates incorporated in a government contract does not entitle the contracting officer to require the contractor to pay increased minimum wages. The General Accounting Office held that the wage schedule included in the contract represented the "true intent" of the parties to it.

A previous ruling given by this office had allowed a contractor's claim for additional compensation where such corrections were made and enforced after the award of the contract. His intent here was to indicate that the contracting officer was acting beyond the scope of his authority in ordering payments on the revised wage schedule.

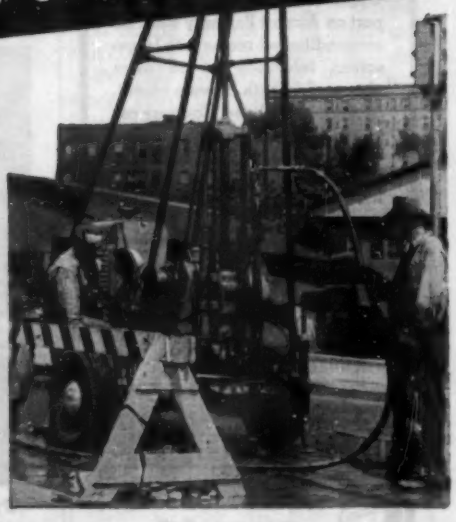
Virginia Turnpike Bids Average 59.25 Cents for Excavation

The 15 roadway contracts recently awarded for the 35-mile Richmond-Petersburg Turnpike in Virginia involved low bids on Regular Excavation ranging from 34c to $1.00 per cu. yd. and averaging 59¼c. Borrow excavation averaged 79c and select borrow $1.30.

A total of 6,100,000 cu. yd. of regular excavation, 3,800,000 cu. yd. of borrow and 321,000 cu. yd. of select borrow will be required for the project.

Of interest is the fact that contractors who ordered the job were low on the regular excavation item only five times on the 15 contracts, indicating unbalanced bids.

drilling for the highways of tomorrow



When it's better to be safe than sorry, engineers investigate underground conditions. And, that's exactly what this Acker TH drill is doing — drilling test holes over a walled-up section of the old Erie Canal preparatory to building an overhead express highway.

For low-cost, dependable sub-soil information, try an Acker on your next job. Several models available with power and type of mounting to best serve your requirements.

Write today for prices and Bulletin 30. R & S

ACKER DRILL CO., Inc.
725 W. Lackawanna Avenue
Scranton, Penna.

a complete line of Diamond and Shot Core Drills, Drilling Accessories and Equipment

. . . for more details circle 233 on enclosed return postal card

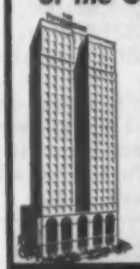
Have You Moved?
or
Changed Your Job?

Send change of address or change of job title to Circulation Manager, Gillette Publishing Co., 22 W. Maple St., Chicago 10, Ill. Give both old and new address, and include postal zone, if any. Send old address stencil, if possible. Allow one month to effect change.

Do others read your copy? Would they like a personal copy? If so, send us name, address and be sure to give title or occupation.

Hotel PITTSBURGHER
PITTSBURGH, PA.

Right in the heart of the Golden Triangle



400 outside rooms with bath. Large-screen television and radio at no extra charge in every room. Air conditioning. Finest dining room.

ATlantic 1-6970

Handiest Locations in PITTSBURGH

Hotel Pittsburgher MOTEL

Opposite Greater Pittsburgh Airport on Airport Parkway west. 56 air-conditioned rooms with large-screen television at no extra charge. Tile bath. Private phone. Restaurant facilities. Courtesy car to and from airport.

AMherst 4-5152

Joseph F. Duddy, Gen. Mgr.

IN NEW YORK
43rd St. just West of Broadway
1000 rooms with radio and MUZAK from $3.75
HOTEL AIR CONDITIONED TELEVISION
TIMES SQUARE
45th Street East of Broadway
400 fine rooms from $4
TELEVISION
HOTEL AIR-CONDITIONED
KNICKERBOCKER

Short Course in Prestressed Concrete Offered in January

A short course in prestressed concrete will again be given by the Civil Engineering Department of the University of Florida in cooperation with the Prestressed Concrete Institute. The course is from January 27th to January 31st 1958 and will be held at Ellinor Village, Daytona Beach, Florida. Registration fee $10.00 per person, with registration closing January 1st. Send remittance or request information from: Prestressed Concrete Short Course, Civil Engineering Department, University of Florida, Gainesville, Florida.

Bids on Federal-Aid Projects Varied Widely in 1956

Statistics on bidding trends on Federal-aid highway jobs throughout the United States and its territories have been published by the Bureau of Public Roads. Some of the noteworthy details:

A total 2,875 projects were reported in 1956 calendar year. These totalled 1,464,000,000 combined low bids. Or about 3.7% below the combined estimates.

An average of 6.4 bids was received per job in the first quarter, 5.0 the second, 5.5 the third, 6.5 in the fourth quarter and 5.8 average for the year.

Among the individual states, the average number of bids per job ranged widely from 3.7 (New York) and 3.9 (West Virginia) to 9.4 (Mississippi) and 9.1 (Colorado). An actual 12 bids per job were tallied during the third and fourth quarters in Wisconsin, but the yearly average was lower.

Compared with the engineers' estimates, bids averaged below estimates in all four quarters on a national average basis. For individual states, bids averaged from as high as 6.2% over the estimates (Tennessee) to as low as 13.2 below (Indiana).

In Colorado which has a very accurate bidding system, the variation in estimates was only 0.5%.

Collect Record Revenues on Ohio Turnpike in August

A new record for toll revenue in a single day was established on Saturday, August 31, on the Ohio Turnpike when a total of $100,651 was collected in cash at the toll booths, according to James W. Shocknessy, chairman of the Ohio Turnpike Commission. The four-day Labor Day weekend saw more than a third of a million dollars—$352,849—paid in cash tolls by users of the turnpike. Commercial toll charge accounts added an estimated $10,000 in toll revenue during the four days.

August produced two additional monthly records, he said, when toll revenue passed the $2,000,000 mark for the first time and truck tolls alone exceeded $500,000 for the first time. The estimated total of $2,700,000 will also establish a new record.

Training School Goes to Dealers

Two huge vans containing nearly $50,000 worth of tractor assemblies and components are bringing a "factory" service training school directly to J. I. Case industrial dealers throughout the nation. A staff of Case servicemen accompanying each mobile training unit present 3-day courses in maintenance and service of Case TerraTrac wheel and crawler tractors and equipment in various dealer's shops. One unit is operating in the midwest and far west, while the other visits the eastern and southern U.S.

● General view showing physical testing area of Caterpillar's new Product Metallurgical and Materials Testing Laboratory.

● "Caterpillar's new Production Metallurgical and Materials Testing Laboratory is an investment in the future and necessary to our continued progress," said C. A. Woodley (left), Caterpillar Tractor Co. vice president. The laboratory is under Thomas H. Spencer (right), Peoria plant quality control manager.

Caterpillar Dedicates Lab for Metallurgical and Materials

Caterpillar recently gave visitors a tour of its new Production Metallurgical and Materials Testing Laboratory at Peoria. One of the world's most modern facilities of its type, the laboratory's function is to insure that all materials used in manufacture are controlled throughout all stages of manufacture, and to develop new metallurgical practices and methods of evaluation.

The new laboratory, constructed as part of the company's growth program, occupies 22,000 sq. ft. of laboratory and office space and employs more than 150 people. Here all new products emanating from suppliers are evaluated; new methods of testing are developed to achieve the highest possible accuracy; control is aided for all materials during processing; proper process procedures are designated for standardizing operations; tooling and other equipment is prescribed to meet metallurgical requirements and new applications are developed. The laboratory facilities include physical testing, photography, spectroscopy, heat treating and other latest techniques which detect weaknesses or help develop improved strength and durability in equipment parts.

Included in the testing are such materials as forgings, castings, bar stock, tubing and ferrous metals, as well as bronze, aluminum, brass of the nonferrous group. Rubber, cork, plastics, paints, oils, solvents, chemicals and fibres receive extensive examination. Tests are also run on structural steel and concrete used in building plant facilities.

Working under the direction of the Peoria Plant Metallurgist are metallurgical, chemical and welding staff engineers who evaluate new materials, establish testing techniques, prescribe specifications, help solve manufacturing problems and develop new applications.

Substitute Materials Being Considered in New York

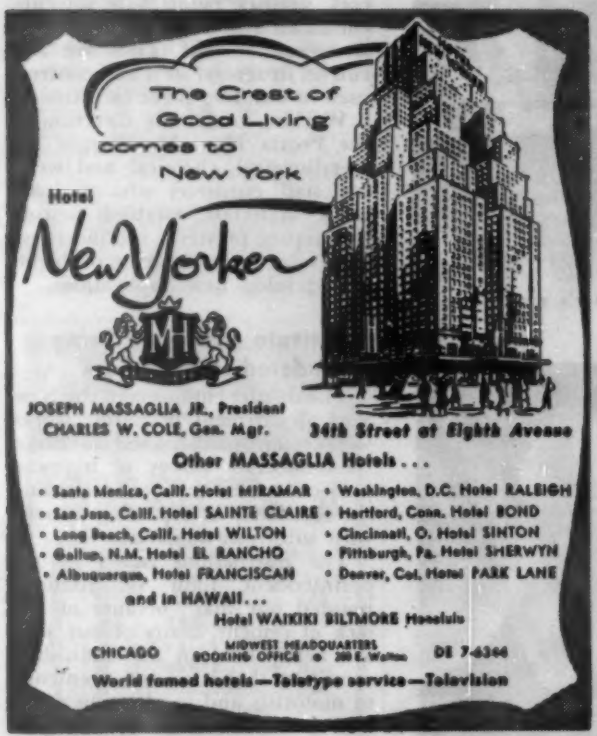
The district engineers of the New York department of public works were recently instructed to make an immediate survey of highway projects under way to determine the feasibility of replacing cement with substitute materials.

The instructions issued by superintendent John W. Johnson pointed out that "because of the lack of cement, many of our jobs are being held in an unfinished condition that is an inconvenience to motorists and to abutting property owners." The instructions went on to state that the substitutions must be recommended only after serious consideration was given to the contractor's preparation and purchase of other materials, such as steel and fabric, joint supports, mixers, finishers, etc. The engineers were advised that availability of substitutes and willingness of the contractor to undertake the change must also be considered.

Possible substitutions listed were stone curb for concrete curb and bituminous materials for concrete foundations, pavements and gutters.

Our Error

In the story "Concrete vs. Asphalt for Military Airfields" (Roads and Streets, September, 1957, p. 59), the statement that "asphalt pavements are failing under heavy plane traffic and the Air Force has no choice but to specify portland cement concrete" was attributed wrongly to Maj. Gen. W. K. Wilson, deputy chief of engineers for construction for the Air Force. The statement was actually made by Mr. John Ferry, special assistant for installations and was merely being cited by Gen. Wilson.


The Crest of
Good Living
comes to
New York
Hotel
New Yorker
JOSEPH MASSAGLIA JR., President
CHARLES W. COLE, Gen. Mgr.
34th Street at Eighth Avenue
Other MASSAGLIA Hotels . . .
• Santa Monica, Calif. Hotel MIRAMAR
• San Jose, Calif. Hotel SAINTE CLAIRE
• Long Beach, Calif. Hotel WILTON
• Gallup, N.M. Hotel EL RANCHO
• Albuquerque, Hotel FRANCISCAN
• Washington, D.C. Hotel RALEIGH
• Hartford, Conn. Hotel BOND
• Cincinnati, O. Hotel SINTON
• Pittsburgh, Pa. Hotel SHERWYN
• Denver, Col. Hotel PARK LANE
and in HAWAII . . .
Hotel WAIKIKI BILTMORE Honolulu
CHICAGO
MIDWEST HEADQUARTERS
BOOKING OFFICE
DE 7-6366
World famed hotels—Teletype service—Television

Manufacturer's Literature

INTERNATIONAL HARVESTER, Construction Equipment division, 180 N. Michigan Ave., Chicago 1, Ill., has released the following catalogs.

"IH Diesel Power Unit Line"—12 pages (CR-509-G), provides the inside story on the 2-4 cyl. units UD-281, UD-350, and UD-14A which range from 60 to 76 hp and on the more powerful 6 cyl. jobs, UD-525, UD-18A and UD-1091, from 115 to 200 hp. Diagrams, cross sections, exploded views and photo closeups are included.

"Earthmoving on Tracks—On Rubber," 16 pages, (CR-542-G) covers the IH mobile construction equipment line, from mining to farming. Catalog includes crawler tractors, Payscraper units, International Drott skid-shovels and 4-in-1 units, and the payhauler units. On-the-job photos depict the uses of each unit.

"Cycle Speeding International," (Models 65′ and 95′ Payhauler, 16 pages, (CR-603-G) contains 4 sections; spotting, loading, hauling and dumping. Closeups of the advantages offered in the Payhauler during each of the above phases are also included.

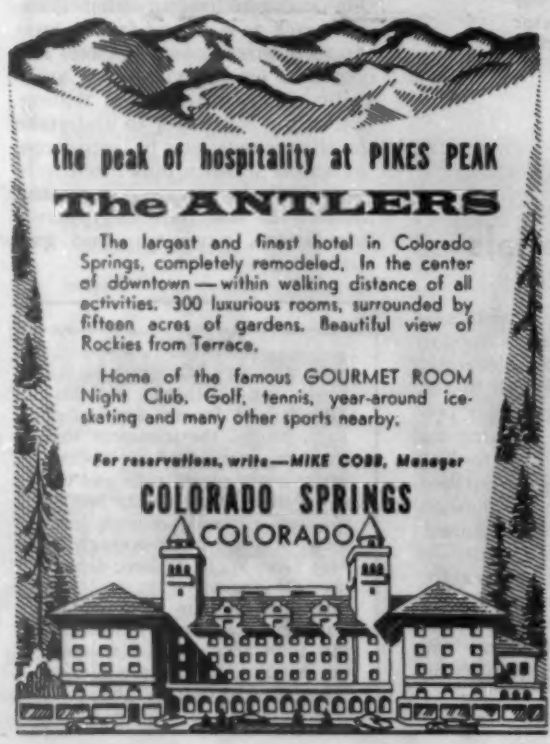
For more details Circle 178 on Enclosed Return Postal Card

DAVEY COMPRESSOR CO., Kent, O., has issued a new bulletin (Form No. E-267) describing their Model 125 Rotary Compressor. Unit illustrations, complete specifications and a rotary compression cycle diagram are important features.

For more details circle 164 on Enclosed Return Postal Card.

"SHOP TALK," a new 8-page booklet released by Caterpillar Tractor Co., Peoria, Ill., describes the dealer's role in supplying parts and service to machine owners. This booklet (Form D745) includes photos and drawings of specialized tools and training facilities available to Cat dealer servicemen. It also tells how an owner's operators and mechanics may enroll in dealer tractor care schools. "Weigh the Evidence" (Form DE744,) a booklet available from the advertising division, discusses the Caterpillar "500" track rollers.

(Continued on page 171)


the peak of hospitality at PIKES PEAK
The ANTLERS
The largest and finest hotel in Colorado Springs, completely remodeled. In the center of downtown — within walking distance of all activities. 300 luxurious rooms, surrounded by fifteen acres of gardens. Beautiful view of Rockies from Terrace.
Home of the famous GOURMET ROOM Night Club. Golf, tennis, year-around ice-skating and many other sports nearby.
For reservations, write—MIKE COBB, Manager
COLORADO SPRINGS
COLORADO

Case histories cite the varied conditions under which these rollers were tested. Illustrated throughout with photos and cutaways, the booklet also presents the views of a leading construction magazine editor on the merits of using manufacturer's genuine parts.

For more details circle 167 on Enclosed Return Postal Card.

LITTLEFORD BROS., INC., has released a new bulletin giving complete details on its Model D Spray Leader heavy-duty bituminous distributor. This distributor is equipped with the durable controls required for applying every type of bituminous material. The bulletin can be obtained from Littleford Bros., Inc., 453 E. Pearl St., Dept. HH-30, Cincinnati 2, Ohio.

For more details circle 168 on Enclosed Return Postal Card.

"RESURFACE OLD PAVEMENTS WITH CONCRETE," a 16 page booklet released by Portland Cement Association, 33 W. Grand Ave., Chicago 10, Ill., takes the reader on a country-wide tour of concrete resurfacing projects to show how these pavements have stood the test of time and traffic. Included is a partial list of resurfacing jobs from which the reader may select those most convenient for his own inspection.

For more details circle 169 on Enclosed Return Postal Card.

THE TREES ON YOUR STREET is the title of a 36-page booklet by Desmond Muirhead, leader of a firm of community and site planners and landscape architects in Vancouver, B. C. The booklet, available from Portland General Electric Co., Portland, Ore., demonstrates varieties of trees and suggests planting arrangements. It also answers questions on tree care. The beautiful illustrations appear both in color and black and white.

For more details circle 170 on Enclosed Return Postal Card.

LE ROI DIVISION, Westinghouse Air Brake Co., has issued three new folders describing the entire line of Westinghouse unit type and Le Roi stationary air compressors. These range in size from ½ to 100 hp. and include both single and two-stage units. Features described in the two-color folders are lubrication systems, automatic protections, and volumes and pressures. Some specifications are also listed. The literature, which is illustrated, may be obtained free from the sales promotion department, Le Roi Division, Westinghouse Air Brake Co., Milwaukee, Wis.

For more details circle 171 on Enclosed Return Postal Card.

"CATERPILLAR TRACTOR SHOP BULLETIN," a 10-page publication (CT57) available from Owatonna Tool Co., 474 Cedar St., Owatonna, Minn., features a wide range of hydraulic and manual tools designed specifically for Caterpillar equipment. Detailed instructions on how to lighten and speed up hard jobs are included.

For more details circle 172 on Enclosed Return Postal Card.

J. I. CASE CO., Racine, Wis., features a power-angling dozer blade for the 80 and 100 hp Case Terratrac crawler tractors in bulletin CTS-106. The bulletin shows how the operator simply moves a lever to angle the blade 21 degrees to either side by hydraulic power. Charts comparing tractor power, speeds and blade action with competitive angle degrees are included, along with two pages on the "counter rotating" Terramatic transmission. The advantages of torque converter drive and the exclusive torsion bar track suspension system are also explained.

For more details circle 173 on Enclosed Return Postal Card.

THE YALE AND TOWNE MANUFACTURING CO., Contractor's Machinery division, Batavia, N.Y., has released a 6-page brochure on its 1¼ cu. yd. Model 104 Trojan tractor shovel. Exclusive Trojan features are described in detail, including the reverse curve safety arms, which give full 360 degree vision and are below the level of the operator even when the bucket is fully raised, independent bucket action, which permits the load to be carried at wheel level, and straight-line horizontal thrust which permits constant crowding of the pile while maintaining full traction on all four wheels and normal steerage.

For more details circle 174 on Enclosed Return Postal Card.

UNITED STATES RUBBER CO., Dept. 259, 2638 Pulaski Rd., Chicago 39, Ill., describes its new material, Lustreform No. 2900, in brochure 57-3. This material is a specially compounded plastic for producing super-smooth concrete panels of high lustre. It is available through qualified distributor-fabricators, capable of shaping it to contours or patterns as desired by architects or designers.

For more details circle 175 on Enclosed Return Postal Card.

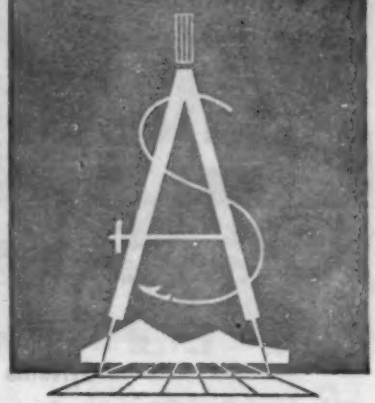
"TAKE A STEP IN THE RIGHT DIRECTION" is a pamphlet (F35) offered by Morton Salt Co., 120 S. La Salle St., Chicago 3, Ill. It details the advantages of using straight rock salt for ice and snow control.

For more details circle 176 on Enclosed Return Postal Card.

DAVID WHITE INSTRUMENT CO., 2051 N. 19th St., Milwaukee 5, Wis., has made available a 4-page catalog describing its new contractor's transit 8200. This new transit designed for contractors and builders offers a full 25 power 360 degree plunging telescope, giving accurate readings up to one minute, it is claimed.

For more details circle 177 on Enclosed Return Postal Card.

AIR SURVEY CORPORATION



Photogrammetric Engineering

Advances starting time.

Conserves engineering manpower.

Produces fast but factual data.

Is economical but exact.

1101 LEE HIGHWAY, ARLINGTON 9, VIRGINIA

For more details circle 234 on enclosed return postal card.

Get Full Facts on the original

ROGERS

DOZER RIPPERS

QUICK ON . . . . . QUICK OFF

RIPS ROCK CONCRETE HARD PAN

Eliminates many types of drilling and shooting

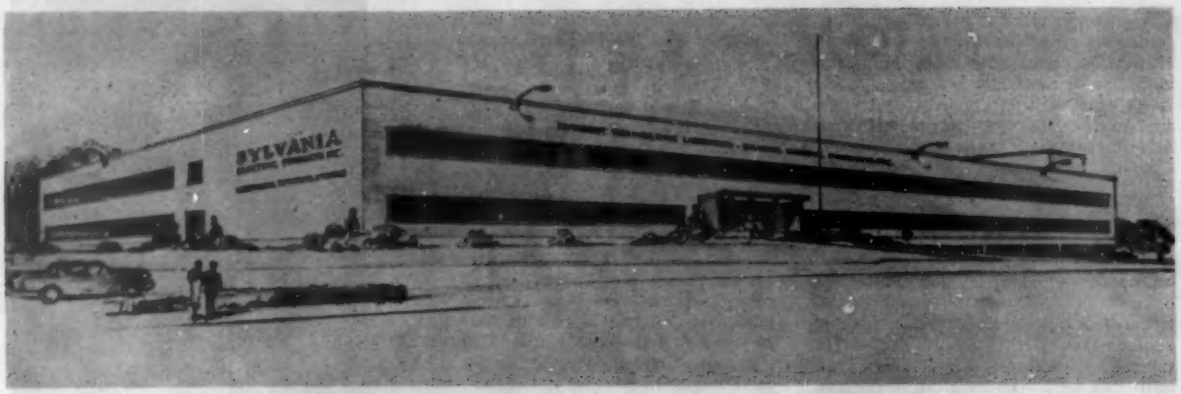
May be used singly or in multiples

Write for name of nearest dealer

E. A. ROGERS COMPANY

P.O. Box 1016, Grass Valley, Calif.

For more details circle 290 on enclosed return postal card.



Sylvania Dedicates New Electronic Research Center

The new Sylvania Electronic Research Center is being built in Amherst, N.Y., to answer the great demand for guided missile technology. This multi-million dollar research facility will be opened early next year, employing about 500 people, about one-half of whom will be engineers.

Sylvania's Electronic Systems Division is now doing research and development for the U.S. Armed Force in the fields of passive defense, guided missiles, communications, radar, computers and control systems. Howard L. Richardson, vice president of the company's electronic operations, claims that scientists and engineers already are convinced that a substantial percentage of the future progress in all areas of peacetime electronics will result from today's missile work.

With the Manufacturers and Distributors

PHILIP J. LARSON was appointed in October to assistant to the vice president, contracting, of U.S. Steel's American Bridge division. It was also announced that Donald J. Morfee succeeds Larson as senior contracting manager at the division's Chicago office.

CLEAVER-BROOKS CO. announces appointment of Automatic Boiler Service and Equipment Co., 130 W. Chippewa St., Buffalo 2, N.Y., as exclusive manufacturer's representative for Cleaver-Brooks self-contained boilers in western New York and four counties in northwestern Pennsylvania. The Pennsylvania office is at 2811 Hastings Rd., Erie.

CONCUT SALES, INC., E. Monte, Calif., has opened a new office in Sacramento, Calif. David J. London, P. O. Box 933, Sacramento, is in charge.

SYMONS CLAMP & MFG. CO., Chicago, Ill., has been appointed national distributor for hardware and accessories of Williams Form Engineering Corp., Grand Rapids, Mich.

WHAT ABOUT YOU, MR. READER?

Are you still active in the field? Have you moved or changed your position?
Unless you send this information directly to us we can't be sure. Sometimes a reader's name is cut from the mailing list because we are not sure that our information as to name, title and address is right. *Your* name might be cut from the mailing list.

Don't Let This Happen to You

Even if you think we know all about you, please fill in the information requested below and send to us by return mail. Our auditors require proof of accuracy of our mailing list. *You* are the only person who can help us on this. Do it now before you forget, so you can be sure your magazine will always be properly addressed to you. New names cannot be added or old names retained on our list unless we have *all* this information. *Please print or type.*

ROADS AND STREETS DATE _____

22 WEST MAPLE STREET, CHICAGO 10, ILL.

☐ I do receive ROADS & STREETS and wish to continue to receive it.
☐ I do not receive ROADS & STREETS but would like to have it.

NAME _____

TITLE OR OCCUPATION _____

FIRM NAME OR GOVERNMENT DEPARTMENT (give street address) _____

_____

CITY _____ ZONE (if any) _____ STATE _____
(If you have moved give *old and new* address)

SIGNATURE _____

ENGINEERS — FOREMEN — OFFICE MEN
Learn latest methods to organize and run work. Prepare for the top jobs. Send post card for details.
GEO. E. DEATHERAGE & SON
CONSTRUCTION CONSULTANTS
P.O. Box 921 Lake Worth, Florida

DISTRIBUTORS WANTED
To sell and rent steel sheet piling in exclusive territories. 1—Ohio, 2—Michigan, 3—Western N. Y., 4—South Carolina, 5—Virginia Line fits in with construction equipment or steel products. Write Box 1191, Roads & Streets, 22 W. Maple St., Chicago 10, Ill.

LIQUIDATION SALE

We are liquidating our stripping equipment. All of it has been well maintained and is in excellent condition.

NORTHWEST - Model 6. Shovel. Murphy diesel motor. Used about one month since being completely rebuilt, including motor. Price:..$23,000.00

CATERPILLAR D9 Angle Dozer. Less than one year old. Price:..... 43,000.00

CATERPILLAR D8, Series 13A Angle dozer. Hyd. blade. New tracks and rollers. 3900 hours. Price:... 21,000.00

MAYHEW Rotary drill on Mack tandem diesel truck. Price:..... 17,000.00

4 - 1952 AUTOCAR C70 tandem dump trucks. 10 ton, rebuilt including motors. Price each 4,500.00

1 - 1948 AUTOCAR C90 tandem 15 ton dump bed. Motor and differential rebuilt. Price: 2,000.00

FLECO STUMPER - Fits TD18, unused. Price:..... 450.00

TERMS CAN BE ARRANGED

WALTON SUDDUTH CO., INC.
Route 2, Box 128 - Phone: DA 7-8903
BLUEFIELD, WEST VIRGINIA

BUCYRUS-ERIE 7-W DRAGLINE
10 x 78 DRYER. 4' & 3' SYMONS cones. Pioneer 54 x 24 double roll. 5360 Impactor. 6 x 14 rod mill. 42 x 48 & 84 x 66 jaws. CRUSHING EQUIPMENT: Jaw crushers - Rolls - Cones - Gyratories - Rod, Ball & Tube Mills - Hammermills - Impactors - Portable Plants. Bins - Bucket Elevators - Classifiers - Compressors - Conveyors - Cranes - Derricks - Drills - Dump Cars - Engines - Feeders - Generators - Hoists - Kilns & Dryers - Locomotives - Motors - Pumps - Screens - Shovels & Draglines - Transformers - Euclid Trucks - Weightometers.
Located In All Parts Of The Country.
STANLEY B. TROYER EQUIPMENT CO.
Box 97 Phone 500 Crosby, Minnesota

DRAGLINE BUCKETS
2½ Yd. Hendrix Heavy Duty.
2½ Yd. Esco—Rebuilt.
Fully Rigged & Priced to Sell.
ANDERSON EQUIPMENT CO.
P. O. Box 1737, Pittsburgh 30, Pa.
Phone: LEhigh 1-6020

CALL UPON MUTUAL FOR THE NATION'S LARGEST
PARTS STOCK
Headquarters All Heavy-duty Equipment, Supplies & Parts
• DUMP TRUCKS • LOADERS • CRANES • ENGINES
Lowest Prices - Complete Satisfaction Guaranteed

NEW and Guaranteed REBUILT ENGINES
Completely Dynamometer "Run-In" and Tested in our own modern, extensive rebuilding shops.
• HERCULES • CUMMINS
• CONTINENTAL • WAUKESHA
• GMC DIESEL

QUALITY — SERVICE — ECONOMY
MUTUAL TRUCK PARTS Co., Inc.
2000 S. WABASH AVENUE
CHICAGO 16 ILLINOIS
Telephone: CAlumet 5-3500

BARGAIN
Rubber Seal Coat Aggregate
Approximately 10 tons of rubber pellets in 100-lb. bags.
Located in Chicago area
GEORGE H. HARTONG, Inc.
340 Sherwood Court
La Grange Park, Illinois
Phone: FLeetwood 2-0825

FOR SALE
CEDARAPIDS
3018 Roller Bearing Roll Crusher - UD-18 International Diesel Engine, and Drives —Mounted on Steel Wheels.
PIONEER
40 x 22 Triple Roll Crusher, Skid-mounted, Vee-Belt Drive, Completely rebuilt—Excellent Condition.
CALL — WIRE — WRITE
INTERSTATE CONSTRUCTION CO.
P. O. Box 16 - Pine Bluff, Arkansas
Phone Jefferson 4-3310

Roads and Streets' Clearing House
REACHES THE MARKET'S HEART
INDIVIDUAL CONTRACTORS
CITY, COUNTY ENGINEERS
CITY, COUNTY OFFICIALS

CLIP YOUR AD COPY TO THIS HANDY ORDER FORM AND MAIL TO

CLEARING HOUSE SECTION
ADVERTISING RATES
TRANSIENT RATE — $11.00
Per Column Inch Per Insertion
CONTRACT RATES — Based on use of total space indicated within yearly period.

12 in.	$10.45
24 in.	10.35
36 in.	10.00
48 in.	9.90
60 in.	9.80
90 in.	9.65
120 in.	9.50
180 in.	9.25
360 in.	9.00

COPY AND CLOSING DATES
Final closing date is the Fifteenth of the preceding month. Magazine is issued 1st of publication month. If proof is desired, copy must be received 5 days preceding closing date.

CLEARING HOUSE SECTION
ROADS AND STREETS
22 W. MAPLE STREET, CHICAGO 10, ILL.
Please Insert the Attached Advertising Copy in the Next Issue of ROADS AND STREETS to Occupy.....Inches of Space.
Number of Insertions.....
NAME.....
COMPANY.....
ADDRESS.....
CITY..... STATE.....
TELL US WHAT YOU HAVE TO OFFER AND WE'LL SET UP THE AD FOR YOU.

SNOW REMOVAL
SNOGO

Sacrifice $6,750
KLAUER MODEL TU3 (8-ft. Sweep)
Mounted on 7½ Ton Oshkosh 4 Wheel Drive Truck.
Unit is in good condition and ready to go to work. The SNOGO is ideally suited for the removal of heavy snow from roads and airports.

WITTENBERG MOTOR CO.

2010 - 15th Ave., West
SEATTLE 99, WASHINGTON Ph. GARFIELD 1651

NEW SPACE HEATERS 25% OFF LIST

5 New Clayton Model HM-300 with Briggs & Stratton 8B Gas Engines, 300,000 BTU's Per Hour. (List Price - $405.00.)
Our Price in Philadelphia -
$300.00 each
Or Five For $1200.00

FRANTZ EQUIPMENT COMPANY
50th & Wynnefield Avenue - Telephone: GReenwood 7-7200
Philadelphia 31, Pennsylvania

Fall Clearance Sale

Bucyrus-Erie 15-B Clamshell Crane, S/N 115879. 35' boom, 24" pads, pendant suspension, maximum counterweight. Less than one year old and in new condition. Priced to sell.

Diamond, Model 77, All American Portable Crushing and Screening plant, new in June 1956 and has run approximately 100,000 tons of material. 10 x 30 Jaw crusher with new jaws, roll crusher, 4' x 12' 2½ deck screen, all conveyors 30" width. Less than ⅔ of new price for a portable plant in excellent condition throughout.

2 Buckeye 120 Ladder type Trenchers. Equipped to cut 24" wide and 11' 6" deep. One machine has set of 12" and 24" buckets extra, so machine will cut from 18" to 36" wide. Both in good condition.

Buckeye 407 Ladder type Trencher, S/N 111. Will dig 24" wide and 8' deep. Powered by a Chrysler gasoline engine. Also includes a quantity of spare parts. A good machine throughout.

3 Rex 3½ yard Truck Mixers, mounted on G.M.C. single axle trucks. Bargain priced. Make an offer, with or without trucks.

Osgood ⅝ or 1 yard Clamshell crane with 45' boom. An old dog, but it will operate. Make an offer.

Call or wire collect:

Beasley-Holmes Co.
3020 Reynolds Road
Toledo 6, Ohio
FRanklin 1494

FOR SALE

25"x36" Telsmith Jaw Crusher Motor & Feeder
30"x42" Buchanan Jaw Crusher Blake Type
24"x36" Farrell Bacon Jaw Crusher Blake Type
18"x32" Telsmith Jaw Crusher Overhead
18"x24" Universal Jaw Overhead
10"x30" Gold Roads
9"x36" Telsmith
10x20 Austin Western Jaw Crusher BB Overhead Excentric
28" Telsmith Intercone Crusher
16" Telsmith Gyratory Crusher
16" Telsmith Gyratory Crusher
10" Telsmith Gyratory Crusher
8" Telsmith Gyratory Crusher
10-20 Blake type Jaw
4' Symons Cone Crusher
3' Symons Cone Crusher
24" Telsmith Cone Crusher
4'x6' Double Deck Tyler Screen
Barber-Greene Ditcher
2—4x14 Double Deck Aggregate Screens.

BLUE BALL MACHINE WORKS
Blue Ball, Pa.

DEPENDABLE USED MACHINES
Terratrac Model 400 w/60" bucket
DC 4-wheel, 12 ton trailer
Northwest 2:6 crane & dragline
Hopto Model 120 with 24" bucket
8' CMETCO 2:202 spreader box
Agricat bulldozer w/gasoline engine
TRACTOR & EQUIPMENT CO.
10032 Southwest Highway, Oak Lawn, Ill.

FOR SALE

16—LeTourneau Super C Tournapulls, Cummins HB600 modified diesel engines, LP Scrapers.
1—Tournapull HSC Hydro Steer Unit for Model Super C Tournapull.
1—Bucyrus-Erie S112 Scraper, 10 cu. yd.
1—Bucyrus-Erie S152 Scraper, 13½ cu. yd.
1—RD8 Crawler with push block DDP Units.
1—RD8 Caterpillar Tractor with dozer blade, root rake and tree pusher.
1—HD5G Crawler with GarWood Hydraulic 8' tilt dozer.
4—TD-18 Crawlers with push block DDP Units, one with 10' dozer blade.
2—TD-24 Crawlers with push block and DDP Units and snatch bar for pole loading Tournapulls.
2—T-9 Crawlers, gasoline, 8'8" dozer blade. Hughes-Keenan Crane with 28' boom.
1—Case LA1 Wheel Tractor with Hughes-Kneenan Crane and 28' boom.
1—Adams 5H512 Motor Patrol, 12' blade, tandem drive.
1—Hendrickson Tractor with HB600 diesel engine, winch and 20' boom, hyd. steering.
1—Large Mobile Concrete Mixer, LeTourneau Model CR, 6 cu. yd. Tournamixer powered with a LeTourneau Model C Roadster which can also be used with a 12 cu. yd. LeTourneau scraper.
1—Complete Portable Concrete Plant including:
  1—Koehring 16E double drum paver, complete with GM diesel engine gear and meters, rubber tired.
  1—Four-compartment Johnson Bin with cement hopper mounted on rubber tires and equipped with a Johnson weigh batcher with a low bin trolley electric powered.
  1—Baughman Bulk Material Silo with unloading auger, loading auger, and vertical screw.
  1—Bulk Cement Car Unloader, complete with undercar attachment and electric vibrator.
1—American Front End Loader with bucket and fork attachments for loading bins.
1—Model F600 Ford Truck with Baughman bulk cement body.
1—LeTourneau Model R Fairlead.
1—LeTourneau Model R Double Drum Power Control Unit.
1—Model 1230B1 Conveyit Concrete Conveyor for mounting on an International Model A Tractor, complete with hydraulic pump, drive and mounting.
1—LeTourneau Model S 3-Tooth Rooter.
2—Model WG3000A3S Wind Power 3 KW Generators - 3 wheel dolly.

WES THOMAS
1640 Quendo - VOlunteer 3-1443
ST. LOUIS 14, MISSOURI

FOR SALE

LATE MODELS MIDWEST LOCATIONS

Manitowoc 3000-B's, 3500's erect cranes — shovels, long booms, wide long cats diesels. Also 2000-B's.
Northwest 6's, 80-D's, and 95 cranes — drags — shovels, diesels, wide long cats — long booms. Incl. BH's.
Bucyrus-Erie 38-B's, 51-B's, 84-B's, cranes — drags, shovels, diesels, wide long cats — long booms.
Marion, Koehring, Link Belt & Lorain model cranes — drags — shovels, wide long cats — diesels. Also backhoe equipped machines, all types.

JAMES C. FRENCH
238 Berry Pkwy. - Talcott 3-4937
PARK RIDGE, ILLINOIS

CYLINDER HEAD REBUILDING SERVICE

CRACKS REPAIRED
MACHINED READY-TO-INSTALL
VALVE GRINDING
PRESSURE AND MAGNETIC TESTING
INTERNATIONAL
CATERPILLAR
G. M. C.
BUDA
etc.
GAS AND DIESEL

CHAPIN CYLINDER HEAD CO.
9 miles west of Jacksonville in
CHAPIN, ILL. (Morgan County) PHONE #3

FOR SALE

Used Construction Equipment

105 CFM SCHRAMM Air Compressor—Good Condition.
105 CFM SCHRAMM Air Compressor—Excellent.
210 CFM LEROI Air Compressor — Just Rebuilt.
500 CFM INGERSOLL-RAND Air Compressor - Good Condition.
500 CFM INGERSOLL-RAND Air Compressor - Like New.
7½ Ton REO TANDEM Tractor—Clean.
99M AUSTIN WESTERN Grader - Fair Condition.
NO. 6 AMERICAN GRADER - Fair Condition.
½ YD. OSGOOD CRANE - Good Condition.
D-4 CATERPILLAR Tractor - For Parts.
TD-24 INTERNATIONAL w/Straight Blade, Angle Blade & Clearing Blade, complete w/80,000 lb. TULSA WINCH. This late model tractor is being completely rebuilt, looks like new and will be available for delivery within 30 days.

S. H. ROBINSON & CO., INC.
703 Cooper St. Knoxville 17, Tenn. - 3-3349

Used Attachments

Cambered Hoe Boom for P & H 150 and 155. Excellent.
Shovel Front for Osgood 200. Also will fit P & H 150. Used two weeks. Shovel Front for Michigan T-6-D crane.
Bucyrus-Erie 22-B boom inserts, 5'-10'-15'-20'.
2 Bucyrus-Erie 22-B Jibs—basic with 10' insert.
Fairlead for 352 and 362 Marion crane.
20' boom sections for 352 and 362 Marion crane.

Call or wire collect:

Beasley-Holmes Co.
3020 Reynolds Road
Toledo 6, Ohio
FRanklin 1494

REX PAVER

Late style Rex 34-E single drum paver, complete with gasoline engine, Hydro-Cycle control system, elevated boom. Excellent condition throughout.

GIBBS-COOK EQUIP. CO.
1314 Walnut St.
Des Moines, Iowa

WE PAY CASH
For Used Const. Equip.
Especially interested in Cat W10, Dump Wagons, DW21, DW10, D8, D7, D6, #12 Motor Graders.
J. F. ENGLAND'S SONS, INC.
P. O. BOX 490
RAPID CITY, SOUTH DAKOTA

DAMP-TO-WET GRAVEL HANDLED IN RECORD TIME

Contractors throughout the country are finding that the Kolman Model 101 Conveyor- Screen Plant comes through with top production under the severest operating conditions.

Here 7-yard trucks are loaded with damp-to-wet gravel in half a minute and ten-yard trucks in than a minute — over 800 tons an hour — by the Zaske Construction Company of Morton, Minn. And Kolman's rugged construction permits handling these heavy loads at constant rates without fear of excessive maintenance expense.

Kolman builds conveyors that are brutes for production and for taking abuse — 18" to 42" belts on portable or stationary units of any desired length, capable of carrying single, two- and three-deck screens without additional support. With Kolman's folding feature, the single-deck screen need not be removed for transportation.

A steel dozer trap with built-in plate feeder, available as optional equipment, is an integral part of the conveyor and fully portable.

Best of all, Kolman Conveyors are competitively priced. Get the whole story before you buy any conveyor or screen.

SEND for FREE literature

KOLMAN Manufacturing Co.
5200 W. 12th St. Sioux Falls, S. D.

USED EQUIPMENT

3—Koehring Dumpsters with GMC diesel engines. Very good condition. $5,000.00 each, f.o.b. Decatur, Ala.

2—15-ton Euclids. New frames—completely rebuilt engines, transmission and final drives. Excellent condition. $13,500.00 each, f.o.b. Birmingham, Ala.

1—15 ton Euclid—AS IS—$6,000.00 f.o.b. Birmingham, Ala.

TRACTOR & EQUIPMENT COMPANY
4401 First Ave., North, Birmingham, Ala.
900 Church St., Decatur, Ala.

SHOVEL ATTACHMENTS

1 - ½ Yd. UC 55 Link Belt.
1 - ½ Yd. LS 60 Link-Belt.
2 - ¾ Yd. NW Model 25.
1 - ¾ Yd. Byers 83.

All Units In Excellent Condition And Located In Los Angeles, Calif.

SHAW SALES & SERVICE CO.
5100 Triggs St. - ANgeles 1-7141
Los Angeles 22, California

FOR SALE

App. 50,000 Ft.
ACME #660
Conveyor - Roller Link Chain

MAKE OFFER TO CLEAR

MOTOR ACCESSORY & SUPPLY CO., LTD.
415 Queen Street, West
TORONTO, ONTARIO, CANADA

FOR SALE

BUCKEYE TRENCHER—MODEL 224, telescopic 36' ladder digs to 24' deep x 110" wide w/rotaries & side cutters, 36" delivery belt, 36" buckets w/H&L teeth. D13000 Caterpillar engine w/heavy duty transmission to travel up to 12"/min. Air pressure lube system. Spare parts. Excellent condition.

BUCKEYE TRENCHER—Model 48, almost new—less than 1000 hrs. Digs 8½' deep x 40" wide w/special rotaries for 110" width. 36" delivery belt. 32" buckets w/ H&L teeth. D13000 Caterpillar engine.

FOB cars, Los Angeles

UKROPINA-POLICH-KRAL
Contractors
Box 105, San Gabriel, Calif.

NO BARGAINS HERE
FIVE REBUILT TRACTORS FROM A TRACTOR HOUSE

ALLIS-CHALMERS

HD-5B Equipped with Baker 5BGE Engine-Mounted Hydraulic Angledozer, 16" Grousers, GM 2-71 Diesel Engine (E-4938) ..... $ 6,500.00

HD-15A Equipped with Baker 15B Hydraulic Bulldozer, GM 6-71 Diesel Engine and GarWood Power Control Unit (D-488) 12,000.00

HD-5G Front End Tractor Shovel, heavy-duty Radiator, Truck Wheels, Hour Meter, Raincap and Counterweight. (E-6179) 9,000.00

HD-5B Equipped with GarWood Front-Mounted Hydraulic Bulldozer, GM 2-71 Diesel Engine, New Track, Idlers and Rollers. (E-4071) 5,500.00

CATERPILLAR

Model D-6, Serial 9U10000 Equipped with Caterpillar Hydraulic Bulldozer, 18" Grousers, New Tracks, Sprockets, Top Rollers, Rebuilt Idlers and Bottom Rollers. Entire Tractor 80% Of New Condition. (E-5808) 9,500.00

FRANTZ EQUIPMENT COMPANY
Wynnefield Ave. & 50th St. — Philadelphia 31, Pennsylvania

FOR SALE
BOTTOM DUMP EUCLIDS

4—17 Yd. Euclids @ ..... $13,500 Each
11—13 Yd. Euclids @ ..... $ 9,500 Each
1—¾ Yd. Shovel front for Model 41 Lorain

All this equipment in excellent operating condition and can be seen at work in South Alabama.

McDOWELL & McDOWELL, Contractors
P. O. BOX 1144 — NASHVILLE, TENNESSEE
Phone AL 5-0304

GRADING & CONCRETE PAVING EQUIPMENT

1—D-8 Cat tractor w/angle blade & DDP unit, S/N 2U5173	$10,000.00
1—D-8 Cat tractor w/angle blade & DDP unit, S/N 1H8690	7,000.00
1—D-8 Cat tractor w/push plate & DDP unit, S/N 1H6122	7,000.00
1—D-7 Cat tractor w/push plate & DDP unit, S/N 7M4127	5,000.00
1—Scraper, GarWood 25 cubic yard, S/N 5231	5,500.00
1—Slusser McLean, Heavy Duty three tooth Ripper, S/N 271	1,000.00
1—10 Ton Buffalo-Springfield Roller, S/N 18680, w/Waukesha gas engine, perfect condition	3,500.00
1—Air Compressor, Gardner-Denver, 210 ft., Cat diesel engine	
1—Air Compressor, Worthington, 105 ft., Waukesha gas engine	
1—Master Vibrator - Electric	200.00
New D-7 and D-8 Bottom Rollers - 80% New Price.	
1—Gardner-Denver Wagon Drill	1,000.00
1—Buda Herndon Earth Drill, with 18" auger, will dig 10' deep hole	1,500.00
1—Backhoe Stick for 255A P & H Backhoe - New	500.00

All this equipment in extra good condition and ready to do a job. Should be inspected to be appreciated. All this equipment is subject to prior sale. Contact us for prices on any not priced.

HART & HART
P. O. Box 52 - Phones: 145K12 or 165
Clay City, Indiana

RIDICULOUS PRICES ON NICKEL - MANGANESE PLATES

(3½% Nickel - 13% Manganese)
Sizes—¼", ⅜", ½", ⅝"

Excellent for: Lining Trucks, Concrete Mixers, Shutes, Buckets, and Dozer Blades

Stanley Kessler & Co.
S.E. Cor. 20th & Atlantic Sts.
Phila. 40, Pa. SAgamore 2-2372

FOR SALE

1—C2 TOURNADOZER, Serial #50416.
1—SUPER C TOURNAPULL MOTOR SCRAPER, Serial #C3T6206C1H.
1—K12 INSLEY BACKHOE, Machine #1454.
1—3 Yd. JAEGER TRUCK MIXER, complete.
1—22W WHITE TRUCK with 22 Yd. FRUEHAUF DUMP TRAILER.

Pictures Sent On Request

R. F. GROVE
1130 Harvard Blvd. - Phone ME 4693
DAYTON 6, OHIO

GOOD BUYS IN USED EQUIPMENT

4500 Manitowoc Dragline, 5 yard, 120' boom.
120-B 5 yard Electric Shovel.
54-B 2½ yard Standard Diesel Shovel.
3500 Manitowoc Dragline, 2½ yard, 80' boom.
Model 6 Northwest 1½ yard Shovel, and Drag.
80-D Northwest 2½ yard Shovel.
111-M Marion Dragline, 4 yard, 90' boom.
903 Osgood Dragline, 2 yard, 70' boom.
22-B Bucyrus-Erie 25 ton Truck Crane.
3900 Manitowoc Erection Crane.
2FFD Euclid 35 ton Rear Dump Trucks.
36TD Euclid 22 ton Rear Dump Trucks.
83FD 15 ton Euclid Rear Dump Trucks.
Mayhew Rotary Truck Drill.
200 Osgood ½ yard Shovel.
D9 Caterpillar Cable Dozer.
BDH Cletrac Diesel Dozer.
Used Ingersoll Rand Wagon Drills.
105 Ingersoll Rand Compressor.
4500 Manitowoc Standard Shovel Attachment.
80-D Northwest 2½ yard Standard Shovel Attachment.
Model TWM-5 Joy Challenger Drill.
300 Amp. Lincoln Electric Welders.

FRANK FAMALETTE EQUIPMENT COMPANY
South Church Street
Hazleton, Pa. GL 5-4708

FOR SALE

1—I.H.C. TD-18 crawler tractor, DD PCU. A1 condition.
1—Model 70 Buckeye dragline, 35-ft. boom. Gas engine. Good condition.
3—Model C Fulpak Letourneau-Westinghouse Scrapers 1500 hrs.
1—Model 120 DTM-53 Hopto on K-6 I.H.C. truck. Hopto in Excellent condition.

INTERSTATE EQUIPMENT COMPANY
P. O. Box 868
Statesville, N. C.
Phone: TR 3-9048

Steel Sheet & H Piling
We Buy—Sell—Rent Piling
Stocks N.Y.—Mass.—Ohio—Tex.

575 pcs. ME 33-25', 34', 60' & 65'
800 pcs. DP 2-30', 40', 50' & 60'
286 pcs. MZ 27-30' & 47'
3960 pcs. SP 6A-44', 60' & 65'
300 pcs. SP 4-20' & 60'
600 pcs. 60' BP12—63#, BP-14, 73 lbs.

PORTABLE CRUSHING PLANTS

15"x24" Primary Portable Crusher, Model 15-A Diamond Crushing Plant, 15"x24" Jaw Crusher 30"x8' Apron Feeder, Hopper, 24"x30' Conveyor, Gasoline Engine, on Pneumatic Tires.

SECONDARY PORTABLE CRUSHER

Model 2A Cedarapids Portable Crushing Plant, 24" x16" Double Roll Crusher, 5'x8' Vibrating Screen, 4 Belt Conveyors, Gasoline Engine, on Pneumatic Tires.

R. C. STANHOPE, Inc.
60 East 42nd St. - New York 17, N. Y.

FOR SALE

4500 Manitowoc Drag, 120', 5 yd.
2400 Lima Drag, 120', 6 yd.
111-M Marion Drag, 100', 4 yd.
1201 Lima Drag, 85', 3 yd.
3500 Manitowoc Drag, 85', 2½ yd.
54-B Bucyrus Erie Drag, 85', 2½ yd.
802 and 604 Lima Cranes
120-B Bucyrus-Erie 4 yd. Elec. Shovel
88-B Bucyrus-Erie 4 yd. Standard Shovel
1201 Lima 3½ yd. Standard Shovel
80-D Northwest 2½ yd. Standard Shovel
K-580 Link Belt 2½ yd. Shovel
51-B Bucyrus 2 yard Shovel
38-B Bucyrus-Erie Shovel-Crane
37-B Bucyrus-Erie 1½ yd. Shovel
22-B Bucyrus-Erie ¾ yd. Shovel
Unit 1020 ¾ yd. Shovel
Also, various smaller Shovel and Draglines
Truck Cranes - Lorain, Bay City, P&H & Link Belt
600 Reich Heavy Mounted Rotary Air Drills
Mayhew Rotary Air Drills
Euclid Trucks - Rear & Bottom Dumps
Caterpillar & International Dozers
Garwood, Allis-Chalmers & Euclid Scrapers

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l. Bank Bldg.
Hazleton, Pa. GLadstone 5-3658

BARGAINS

Caterpillar D-8 with LeTourneau DDPCU. S/N 1H5780. Steal at..$1,950

"D" Roadster Tournapull with E-9 Scraper. New 1953, $2,000 worth of new repairs just installed..... 7,950

Consider Trading This Unit On A Good Cat 70 Scraper.

Super "C" Tournapull with 17 cu. yd. Wagon. Good Unit for..... 1,750

All Prices F.O.B. Western Virginia Locations.

LANFORD & SLATER, Inc.
P. O. Box 5127 - Phone EMpire 6-2579
ROANOKE, VIRGINIA

HOUGH Model HR pneumatic tired Loader, 1 yd. bucket, all wheel drive, late model, rebuilt and in guaranteed condition. **$5950.00.**

Ingersoll Rand 315 cu. ft., diesel powered Air Compressor, on pneumatic tires, excellent rebuilt condition, **$3450.00.**

O. C. EVANS
Mt. Sterling, Kentucky

ROLLERS!!

Rebuilt D4 Roller Assembly With Seals $42.50
Rebuilt D6 Roller Assembly With Seals $55.00
Rebuilt D7 Roller Assembly With Seals $65.00
Rebuilt D8 Roller Assembly With Seals $75.00

We stock new rollers, top and bottom, new sprockets, new idlers and track rail assembly for all AC, Caterpillar and IHC crawler tractors. All these at a big savings!

We are junking out 3 HD-5B tractors—one HD-5G loader.

We stock new and used parts on all IHC, Caterpillar and AC tractors. 50% off on all good used parts.

We are looking for a "live wire" tractor parts replacement house, who can do justice to our AMPARTS line, which consists of rollers and all component parts. The states that are open are Arkansas, Tennessee, So. Carolina and Louisiana.

We have in stock three (3) used HD-5 GMC 271 engine assemblies, complete, $550.00 each—As is.

New IHC TD-18 water pumps, $12.50 ea.

JACKSON TRACTOR PARTS COMPANY, INC.
Highway 80 West, P.O. Box 3124 - Ph. 2-6641
Jackson, Mississippi

A REAL BUY—EVERY ITEM

1—Buckeye Model 407 Trencher, Serial No. 208. Condition Good.....$7,500.00

1—Bay City Model 45 Diesel Backhoe, 1½ years old. Condition Good..$15,000.00

1—Bucyrus-Erie 108 Backhoe. Serial No. 10269. Condition Good.....$7,000.00

1—600 LeRoi Compressor with Murphy ME-21 Engine on four (4) Pneumatic Wheels. Serial No. 313 x 173. Condition Good $7,500.00

1—Lima 703 SC—50 Ton Crane with 80 ft. Boom, 20 ft. Jib. Allison Torque Converter. Used three (3) months. Will rent or sell.

All Equipment Prices is in our yard.

Cleveland Contractors Equipment Co.
10904 Brookpark Road SH 1-5570
CLEVELAND, OHIO

LEROI TRACTAIR COMPRESSOR
Self Propelled, 105 cu. ft. Machine. Good Rubber, ready to go.
Specially priced at $1,350.00

ANDERSON EQUIPMENT CO.
P. O. Box 1737, Pittsburgh 30, Pa.
Phone: LEhigh 1-6020

EXCELLENT USED EQUIPMENT BARGAINS

1—Adams 512 Motor Grader—Serial No. 5913....$4,490.00

1—Cartright 1300 Gallon Distributor $1,500.00

1—HMD—Hough Payloader $7,500.00

1—Model HF Hough Payloader—Excellent condition .$3,500.00

1—New model "AS" Highway Bituminous Spreader — used 2 hrs. $1,795.00

1—10-12 Ton Huber Tandem Roller. 1951 model—Excellent $3,895.00

1—Buckeye — model 406 — Ditcher — Good ...$4,495.00

1—Complete Black Top outfit 700 Trail-O-Patch Galion 3 to 5 Ton Roller Miller Tandem Tilt Top Trailer, Littleford #101—1000 Gal. Utility Tank complete. Special Price.

Several TD-18s - TD-14s and TD-9s with Dozers. Also several TD-6s with end loaders.

CAPITOL TRACTOR & EQUIPMENT INC.
Route #150
Phone 4-2461
Morton, Ill.

719-21 E. Jefferson St.
Phone 5600
Springfield, Ill.

CRANES & SHOVELS

BANTAM "M-49"—⅜ yd. Trench Hoe, mounted GMC 6x6.
SARGENT "410"—New ⅜ yd. Hoe or Crane, mounted on new Crane Carrier. Substantial discount.
INSLEY "K-12"—½ yd. Trench Hoe, Crane or Dragline, (2).
MARION "331"—¾ yd. Shovel or Dragline.
BYERS "83"—Used ¾ yd. Crane or Dragline.

LOADERS

CATERPILLAR "D-4"—Diesel Tractor w/ Trackson Tractor Shovel. Rebuilt tracks and engine.
CATERPILLAR "D-6"—Diesel Tractor w/ Hi-Lift Cable Traxcavator, 1950 model in fine shape.
ALLIS-CHALMERS "HD5G"—Used Diesel Tractor w/Tractomotive Front End Loader, Rebuilt tracks and engine.
INTERNATIONAL "TD-9"—Used Diesel Tractor w/Bucyrus-Erie Hydraulic Tractor-Dozer.
PETTIBONE "10"—Used 1 yd. Tractor Shovel, 4-wheel drive.
HOUGH "HM"—Used 1½ yd. Tractor Shovel, 4-wheel drive.
BARBER-GREENE "545-46-3" — Used Rubber-Tired Bucket Loader.
HAISS "75C"—Used Crawler Bucket Loader @ $2000.

MISCELLANEOUS

GRUENDLER "1024"—Roller Bearing Jaw Crusher.
PETTIBONE-WOOD "820A"—New Windrow Proportioner. Reduced for quick sale.
PETTIBONE-WOOD "P620"—Used Preparizer, G-M Power, Diesel. Will rent or sell.
JAEGER 3 yd.—(4¼. Agitator) Hi-Discharge Mixer, unmounted, sandblasted, cleaned & painted.
*JAEGER 4½ yd. — Hi-Discharge Transit Mixer, mounted 1953 GMC "450" Tandem Truck.
*CMC 3½ yd.—Hi-Discharge Transit Mixer (1954 model), mounted 1954 Ford C750 Truck (single axle) w/19,000 miles.

*NOTE: This Equipment Located in our Yard except as marked **

EIGHMY EQUIPMENT COMPANY
120 S. Pierpont
Phone 4-6706
ROCKFORD, ILLINOIS

OPEN END WRENCH SET

Dropped forged slugging Wrenches, 15 deg. open end. 16 Wrenches, 3/8" to 2¼" openings. Includes canvas roll. $44.50 value

$14.95 PREPAID

F & R COMPANY
DRAKESVILLE, IOWA

ARMY SURPLUS ROLLERS LIKE NEW
SIXTY DAY WARRANTY $5500.00 EACH

Buffalo Springfield 12-ton Tandem #19557, Hyd. Steer, sprinkler system, diesel power.

Huber 10-ton 3-wheel #10-821, hyd. steer. and hyd. scarifier, Hercules gas power.

Galion 10-ton 3-wheel #CG-15210, hyd. steer, hyd. scarifier, Hercules gas power.

Galion 10-ton Tandem, hyd. steer, UD-6 Diesel #R-25165.

UDELSON TRUCK SALES, INC.
3210 Woodland Ave. — Cleveland 15, Ohio
R. Snyder — Superior 1-1666

"Wanted—

Blaw Knox (APSCO) Widener. Advise age, condition, location, and price." Write Box 1184, Roads & Streets, 22 W. Maple St., Chicago 10, Ill.

FOR SALE OR RENT

Lima Diesel Crane. Model 602. 1½ yd. bucket and 30 ton crane capacity. 120 ft. boom, plus jib. Independent boom hoist. General Motors 174 HP diesel engine. Crawlers 16'10" long.

Price $20,000 f.o.b. car.

WHISLER EQUIPMENT CO.
1906 Railway Exchange Bldg.
St. Louis 1, Missouri

FOR SALE

Priced to Sell!

1. Northwest Model 6 1½-yd. Crawler shovel with Murphy Diesel.
2. Bucyrus-Erie 22-B transit crane on 9-ft. carrier with 80-ft. boom, 30-ft. jib.
3. Osgood Model 710 1¼-yd. Crawler with Cummins Diesel. Drag attachment available.
4. Marion Model 93M 2½-yd. Crawler shovel with D17000 Cat. Diesel.

All machines in very good condition and ready to go to work.

GEORGE H. RANZAU CO.
461 Bayberry Lane
Mountainside, New Jersey
Telephone: ADams 3-5831

TRUCKS WANTED

Highest dollar value paid for new and used trucks and all kinds of used equipment. All types of truck equipment bought and sold, including war surplus.

Write, phone or wire:

BILL FISHEL
Vandeventer Auto Sales
717 So. Vandeventer — St. Louis 10, Mo.
Ph. Franklin 1-1750

FOR SALE

Barber-Greene Model 705-B Runabout Service Ditcher with Backfiller Blade.
Sargent ⅜-yd. Truck Crane with 30' Boom, Backhoe and Fairleader.
Avery Samson Digger mounted on 2-Ton Chevrolet Truck.
All in excellent condition - priced for quick sale

CURRY EQUIPMENT CORPORATION
3132 W. Thompson Street
Philadelphia 21, Pa.
'Phone - Po. 3-2228

PORTABLE MIXER BARGAIN

6S Worthington, LeRoi Water Cooled Engine, Power Skip, Towing Tongue, mounted on 2 new pneumatic tires. LIKE NEW $850.00

ANDERSON EQUIPMENT CO.
P. O. Box 1737, Pittsburgh 30, Pa.
Phone: LEhigh 1-6020

USED EQUIPMENT

CONSTRUCTION
QUARRY
ELECTRICAL
MACHINE TOOLS

"NATIONAL COVERAGE"

1—3 ft. Symons Cone Crusher, standard bowl with 60 hp. motor 440/3/60.

30" x 42" KVS Blake Type Jaw Crusher with motor & spare parts.

1—37½ KVS GYRATORY CRUSHER. 1950.

1—315 KW Diesel Generating Plant with Cat D 397 diesel. 240/480 volt. 1952. Overhauled 1956.

CHARLES V. FISH CO., INC.
530 Hamilton Street
Allentown, Penna.
Telephone: HEmlock 5-4701

FOR SALE

EUCLID TRUCKS — Rear and Bottom Dumps.
SHOVELS, DRAGLINES—all sizes, makes, crawler and walking type, diesel and electric powered.
WELL DRILLS—Rotary and Churn type.
TRUCK CRANE
CATERPILLAR Dozers & Graders
ROGERS 35 Ton LOWBED TRAILER

Spare parts for 120B & 9W Bucyrus-Erie

"Other Equipment Available not Listed Above"

WILLIAM LUBRECHT, III
Construction Equipment
311 W. Diamond Ave. — Hazleton, Pa.
Phone: Gladstone 5-4041 or 5-0253

FOR SALE

1—955A P&H Crane with 100 ft. boom, s/n 14821, and Waukesha diesel motor, 2 yd. Hendrix perforated dragline bucket.
2—D-8 78 inch gauge diesel engine driven crawler tractor, s/n 2U16296 and 2U6726. Equipped with Caterpillar #8S cable-operated straight blade bulldozer, #25 rear mounted double drum cable control.
1—#70 cable-operated 4-wheel Caterpillar Scraper, s/n 3W6055.
1—HD5G Hi-lift, s/n 15855.
1—365 Air Compressors, s/n C-12323, powered by International Model UD18A diesel engine.

K. H. GREGORY CO., INC.
Home Federal Building, Phone Drake 2-2361
XENIA, OHIO

FOR SALE

CATERPILLAR DW 21. Low hours. Excellent condition throughout.

GIBBS COOK EQUIP. CO.
1314 WALNUT STREET
DES MOINES, IOWA

FOR SALE

GOOD Used Contractors Machinery PRICED RIGHT

1—Cat D8 Tractor, S/N 2U-16758.
4—A-C HD-20 Tractors w/DDPCU and Dozers.
1—Gobhard 60" Sheepsfoot Roller.
1—Hendrix TS - 5 cubic yard Dragline Bucket.
1—Esco Medium Weight 6 cubic yard Dragline Bucket.

ABOVE ITEMS LOCATED UPPER-STATE NEW YORK

1—Rex Dual-Drum 34E Paver - S/N GD-214.
1—Winslow 30 Ton - 26' x 10' Platform Scales.
7—Euclid 12 TDT-17 cubic yard Bottom Dumps.
3500 Lin. Ft. 9" Blaw-Knox and Heltzel Paving Forms.

ABOVE ITEMS LOCATED IN KANSAS

2—A-C HD-20 Tractors w/DDPCU and Dozers.
1—A-C HD-20 Tractor w/Push Plate.

ABOVE ITEMS LOCATED IN NORTHERN CALIFORNIA.

1—Northwest Model 6 Combination Shovel/Dragline, powered w/Murphy Diesel. Less than 1500 hours.
1—Northwest Model 80-D Shovel powered w/Murphy Diesel ME-66. Completely rebuilt.
4—Caterpillar DW-21 Motor Scrapers. All have wide heads.
1—Cat D-8 Tractor, 2U Series w/stick DDPCU and Dozer.
17—Euclid Model 43 FDT - 13 cubic yard Bottom Dumps.
1—Blaw-Knox 20' - 25' Concrete Spreader.

ABOVE ITEMS LOCATED IN OR NEAR DALLAS, TEXAS.

MILLER C. BEASLEY MACHINERY CO.
2015 N. Industrial Blvd. - Phone RI 2-2907
P. O. BOX 5266 - DALLAS, TEXAS

FOR SALE

TD14 International bulldozer with Bucyrus-Erie hydraulic unit, in good condition, $2,850.00 DC-100T Autocar tractor, $1,200.00.

MUSKE MACHINERY CARTAGE, INC.
Franklin Grove, Ill. Phone 128

FOR SALE

30 Ton Truck Crane, American 395BT, Serial #GS-2146, 1 yr. old, Excellent Condition. $32,500.00.

(3)

EUCLID 23TDT-215H Single Engine Scrapers, Top Extensions, Allison Transmissions, 1400x24 Front Tires, 29.5x25 Tires, Rear Tractor & Scraper, Serial #S-19452-19453-19454, Excellent Condition, 2½ yrs. old. $30,000.00 each.

W. H. KOPPELMAN, INC.
P. O. Box 152 White Marsh, Md.
Phone EDgewater 5-6021

TIRES! SAVE AT BARONS

Quality Merchandising at Low Prices.

Satisfaction guaranteed or your money back. Will refund purchase price for any tire not acceptable.

NEW RECAPPED TRUCK TIRES

600-16—Jeep	12.75
650-16—6 Ply	13.75
700-16—6 Ply	15.75
750-16—6 & 8 Ply	17.75
750-20—8 Ply	22.75
825-20—10 Ply	33.75
900-20—10 Ply	39.75
1000-20—12 Ply	42.75
1100-20—12 & 14 Ply	43.75
1100-22—12 & 14 Ply	47.75
1100-24—12 & 14 Ply	50.75
1200-20—12 & 14 Ply	50.75
1000-22—N.D.	42.50

NON DIR. AND LOGGER DESIGN AVAILABLE

GOOD USED TRUCK TIRES

600-16—Jeep	8.75
650-16—Conv.	9.75
700-16—Jeep	11.75
750-17 Conv.	13.75
600-20—Take off	12.75
750-20—Conv.	14.75
750-20—N.D.	15.75
825-20—Conv.	21.75
900-20—Conv.	21.75
900-20—N.D.	23.75
1000-20—Conv.	25.75
1000-22—Reg. & ND	25.75
1100-20—Reg. & ND	26.75

NEW OR GOOD USED TUBES FOR ALL SIZE TIRES LISTED

750-16 Combat Conv. Hi-Tread. Perfect
18.50

1100-20—12 & 14 Ply Reg. or N.D. 90%-99% Tread. Perfect
45.00

900-16 8 Ply Army Tread. Perfect. Hi-Tread 15.00. Med. Tread
11.50

1400-24 20 Ply. Perfect. Hi-Tread. Non. Dir.
55.00

750-20 8 Ply. New, Take Off Original Tire & Tube.
47.50

TERMS 25% DEPOSIT WITH ORDER
For Your Best Deal on Tires & Tubes Call or Write Baron Tire Company. Credit Towards Purchase on All Long Distance Telephone Calls. All Inquiries Invited on Sizes and Types Not Listed.
Selling Tires for Over 25 Years.

BARON TIRE COMPANY
122 Second Street
Chelsea, Massachusetts
Phone CHELSEA 3-2731 - 1452

BAILEY BRIDGES

Sectional Steel Truss Type
Portable - Fully Prefabricated
Variable Span and Capacity
Cantilever Erection
Expert Construction Supervision

RENTALS or SALES

BAILEY BRIDGE EQUIPMENT COMPANY
1767 Conejo Ave., San Luis Obispo, Calif.

FOR RENT - BARE OR FULLY OPERATED
Mobile Cranes—10 to 45 ton. 150' boom plus jibs.
Gradalls—with all attachments.
Cleveland Trenchers—Models 95 to 140.
BUCKS COUNTY CONSTRUCTION CO.
Box 66 - Penndel, Penna.
Phone - Skyline 7-8795

FOR SALE
CONSTRUCTION EQUIP.

848A Barber-Greene Portable Asphalt Plant. Cap. approx. 200 ton per hr., new 1955. Price: $78,000.

1 Simplicity Asphalt Plant 50 ton per hr. Complete with Bins, Storage, Tanks, Dryer, Cummins Diesel Motor Fruehauf Tool House. Pr. $31,500.

848 Barber-Greene Portable Asphalt Plant, Cap. 100-150 tons per hour. Just rebuilt at cost of $16,000. Price: $60,000.

848 Barber-Greene Asphalt Plant Mfg. 1948 Electrified 1954.

3 CT Le Tourneau Turnomatic Turnapulls. Serial #2825, Pr. $9,000; Serial #2826, Pr. $9,000; Serial #5005, Pr. $10,000; all for $24,000.

2 Euclid S 18 Series 27 LDT Serial #19000 with 27 SH Scrapers Series 9,000 New Modification. Excellent, $25,000 each. Both $47,500.

3 DW 10 Cats. With #15 Scrapers, Series IV2600. Very Good, $12,000 Each. All for $28,000.

1 DW 21 Cat. Series SW 680 with #21 Scraper less than 2700 hours. Drive tires like new. Scraper tires 85%. Excellent, $23,000.

3 Terra Cobras Series 53000. Excellent. Each $11,500. All for $30,000.

2 Allis Chalmers T.S. 360 Scraper Series 1200 used approximately 16 months, excellent, including rubber. Both $32,000

5 Model FP LeTourneau Carryall Scrapers Series 33000 to 35000. Excellent. Each $3,750. All for $18,000.

2 Bucyrus-Erie 170A Scrapers serial numbers 84761 & 90256, 90% of new condition including rubber. Each $8,000. Both $15,000.

Cat #70 Scraper Ser. #8C 2702 Scraper and tires, excellent, $6,250.

1 50 Ton Ferguson Rubber Tires Compactor Model RT-100-S-50. Excellent, $5,250.

1 Lima 802 Shovel and Dragline Combination D-17000, Engine Serial #3168. 70 Ft. Boom Paige or Hendrix Bucket 32 in. Extended Tracks. Excellent, $31,500.

1 L80 Lorain Comb. Shovel and Dragline Series 14600 D 13000 engine. $7,500 spent on repairs. Excellent, $22,000.

1 L50K Comb. Dragline and Camel Back Backhoe Series 23600 D318 Engine 50 ft. Boom very good $20,000. Both L80 and L50K for $38,000.

1 Northwest 25 Ser. #7058 35' Boom, ¾ yd. Hendrix Bucket-Machine rebuilt including motor. Price $6,000.

2 Barber-Greene Finishers 879, $55,000; 879A, $6,500. Various other items, Rollers, Street Brooms, Buckets, Tractors. Asphalt Distributors call us for your job requirements.

POWELL EQUIPMENT CO.

SHIP—OFFICE &—YARD
Located at
646 Atando Ave., Charlotte, N. C.
Telephone: FRanklin 68770
Home Tele.: Salisbury, N. C., 3860

SELL OR TRADE

RECONDITIONED TRAVELOADER

Ideal for steel erectors, lumber yards, wrecking yards, etc. Picks up 10,000 lbs. like a straddle truck, delivers like a highway truck, and stacks like a fork truck up to 12 ft. high. Has power steering and power brakes. This machine, with only one operator, does the job faster, safer, and much cheaper than other equipment - saves time up to 70%.

ALLIS-CHALMERS ROAD GRADER

8 ft. blade with ½ yard hydraulic bucket mounted on front. 1200 x 24 tires.
1948 - KB5 - Heavy duty 1½ ton walk-in trucks, steel floor.....$395.00 each

NEW BLOCKS

Block, haul back, for wire rope, heavy duty, annealed steel shell, manganese steel sheave, steel alloy pin, tapered roller bearings, special lubricating device, heat treated steel alloy shackle and draw pin, 10 in. sheave, 1 in. rope. $81.00 value for $35.00 ea.

Block, ordinary, for manila rope, regular duty, steel shell, japanned, button head pin with cotter, self-lubricating, bronze bushing, hook, swivel, loose and plain bottom, japanned 7 in. shell, 1 in. rope. $4.25 value for $1.95 ea. In lots of 25 or more, $1.50 ea.

Block, ordinary, for manila rope, regular duty, steel shell, japanned, single cast iron sheave, japanned, button head pin with cotter, self-lubricating, bronze bushing, hook, side, loose and becket, japanned, 8 in. shell, 1 in. rope. $2.50 value for $1.25 ea. In lots of 25 or more, 95c each.

Lumber Buggy - two-wheel - metal weld - Model 17 - $255.00 value for $40.00 each.

Shipment: C.O.D., Freight Collect
Open Sunday.

SKIPPERS AUTO & TRUCK SALVAGE

2701 Wayne Trace - Fort Wayne, Indiana
J. R. GZYBOWSKI, Owner

PILE DRIVING EQUIPMENT

VULCAN AND McKIERNAN-TERRY
Steam Pile Hammers and Extractors

- DROP HAMMERS
- STEEL LEADS
- DRIVING CAPS
- PILE DRIVER HOSE
- HOISTS AND BOILERS

STEEL SHEET PILING

Pcs.	Section	Length	Location
94	MP-116	34 to 35 ft.	Wisconsin
101	MP-116	15 to 20 ft.	Iowa
75	MP-116	60 ft.	Chicago
110	MP-115	35 to 60 ft.	Kansas City
130	MP-116	35 to 45 ft.	Alabama
36	MP-115	60 ft.	Nebraska
175	MP-116	35 to 60 ft.	Kansas City

CONMACO — PHONE DRexel 1-3930
CONTRACTORS MACHINERY COMPANY
806 KANSAS AVE., KANSAS CITY, KANSAS

ATTACHMENTS AVAILABLE

Northwest - Bucyrus-Erie - Lima - Marion - Link Belt - Lorain - P&H - Manitowoc. Shovels - Backhoe - Clam Drag - all sizes.

JAMES C. FRENCH
226 Berry Pkwy. Talcott 3-4927
PARK RIDGE, ILLINOIS

BIG SAVINGS
BY BUYING
BOMBER TIRES!

Already Adapted - No need to change your present wheels. Tires are all Nylon construction and fully guaranteed.

TYPICAL EXAMPLES:

	PLY	TYPE TREAD	PRICE
1600x20	22	Rolling	$150.00
1600x24	32	Rolling	200.00
1600x25	32	Rolling	200.00
1800x24	32	Rolling	200.00
1800x25	32	Rolling	200.00
2100x24	30	Rolling	350.00
2100x25	30	Rolling	350.00
23.5 x25	30	Rolling	350.00
2400x25	30	Rolling	350.00
26.5 x25	30	Rolling	350.00
29.5 x25	30	Rolling	350.00
65"	26	Rolling	385.00

NOTE: ROCK LUG TREADS ARE AVAILABLE IN ALL SIZES.

EXTRA SPECIAL: 2 - 29.5x29 22-Ply NYLON TUBE TYPE TIRES - ROCK SERVICE TREAD - 20% WORN - NEW GUARANTEE .....$875.00 Each

PRIOR TIRE COMPANY
458 Peachtree St. N.E.
JAckson 2-8866
ATLANTA, GEORGIA

WANTED

2—Arcwall Cutting Machines.
1—Set of Truck Platform Scales - 40' minimum length.

FOR SALE

1—Low Vein Goodman Cutting Machine.

1—Standard Goodman Cutting Machine.

1—Almost New TD-18, Bulldozer, with angle blade. Used less than 200 hours. Original paint still on blade. Only.....$15,000.00

20—Five Ton Sanford Day, all steel, drop bottom mine cars. Designed for use on 42" or 44" gauge track. Overall height above rail, 28". Each $200.00

4500 Manitowoc Hi-Lift
4 Yd. Bucket Shovel 3000 Hrs.

CALL OR WRITE:

BLUE GRASS MINERALS, INC.
Pineville, Kentucky
Telephone: EDgewood 7-2381

Construction Co. for Sale

One Hundred Sixty Thousand Dollars ($160,000.00) Tax Loss

No Equipment Involved

Box No. 1192
ROADS & STREETS
22 W. Maple St.
Chicago 10, Ill.

THESE ITEMS LISTED AS SURPLUS TO OUR NEEDS

1—820 Lorain Shovel Front Clamshell Dragline 80 ft. Boom, D13000 Eng. This machine is in very good condition. $18,000.
1—22-B Erie shovel & backhoe. UD14A Diesel. $5,000.
1—1½ Yd. Byers Dragline. $2,000.
1—TD14A Standard Bulldozer. $5,000.
1—TD18A Bulldozer. $5,000.
3—125 Gyro Flo Truck Mounted Compressors. Ea. $2,500.
1—C-84 LaPlante Choate. 16 Yd. 4-wheel cable pan. $3,000.
1—Super C Pull. $3,000.
1—112 Cat. Patrol Grader. $3,000.
1—10 ton 3 wheel Huber Roller Hyd. steering. $2,000.
1—DC100 Autocar Tractor and 20 ton Mastercraft trailer. $4,500.
1—4" Jaeger Centr. Pump. $ 500.
1—4" Novo Diaphragm Pump. $ 300.

Misc. Dynamite Boxes — Blasting Machs. — Skill Saws — Drills — Winches — Mason's Equip. — Scaffolding — Stud Drivers, Etc.

ALBERT RITZ—CONTRACTOR
Phone Days—DA 4-3185
Eves.—DA 4-2543
STAMFORD CONN.

Manitowoc 2000B

1¼ Yard Lifting Crane, S/N 2481. Has a Cummins BI diesel engine. Equipped with 15′ crawler and 30″ pads. 100′ boom. This 1949 machine has been completely overhauled and is in top condition. A real buy.

LORAIN MOTO CRANE

MC 414 20 ton Moto Crane. 1947 machine. 95′ boom with 20′ jib. Waukesha engine top & bottom. Independent 1500 watt Kohler light plant. Equipped as crane, drag & clam. Completely overhauled and in A-1 condition.

Bement-Cahill Equip. Co.
7900 Irving Ave., S. - TUxedo 1-5887
Minneapolis, Minnesota

CATERPILLAR D7
With Angleblade & Double Drum PCU, in good running condition.
Reasonably priced.
ANDERSON EQUIPMENT CO.
P. O. Box 1737, Pittsburgh 30, Pa.
Phone: LEhigh 1-6020

ATTENTION

CONTRACTORS TIRE SHOPS

LEE 1200 x 20 14-PLY TIRES

$35.00 EACH

COMPLETE TIRE AND TUBE - GUARANTEED FREE OF BREAKS - LEE NON DIRECTIONAL TIRES - 75% TREAD

ONLY 150 TIRES — NO TAX.

Prices F.O.B. Minneapolis In Quantities of 6 & up.

Write - Wire or Phone - DON ROOD FEderal 9-8881

NORTHWESTERN PARTS DIVISION
NAPCO INDUSTRIES, INC.
834 North 7th Street — Minneapolis, Minnesota

FOR SALE

4—Euclid Rear-end Dumps Model 36TD Cummins NRT Diesel. New June, 1957. 700 hours.
2—International Payhaulers "Model 95", Turbocharged Diesel Engine. New June, 1957. 500 hours.
4—DW-21 Caterpillar Tractors Series "C". 29.5 x 29—34 Ply Tires. New June, 1957. 600 hours, and
4—PR-21 Athey Rear Dump Trailers. 600 hours.
1—4500 Manitowoc 5 Yd. Shovel Cummins VT12 Diesel Engine with Torque Converter. 1000 hours.

DONALD M. DRAKE COMPANY
1600 N. W. Savier St.
Portland 9, Oregon
CA 6-3991

FOR SALE

Bucyrus Erie Model 54-B Shovel Serial 20035, 2½ C.Y. Digging Bucket; also a 60 ft. Crane Boom. Powered by Buda-Lanova 6DH1742 diesel engine. Condition good. Located Downsville, N. Y.

BIANCHI, CENTRAL, MUNROE-LANGSTROTH, RUGO
24 Union Avenue
Framingham (Trinity 2-4341) Mass.

FOR SALE

120 ft. 18 inch, 80 ft. 18 inch channel frame conveyor with electric motors.
Three 40 ft. 18 inch portable with electric motors.
Four 20 to 25 ft. 18 inch conveyors, one 40 ft. 24 inch portable with electric motors.
250 ft. 30 inch channel frame with electric motors.
One 60 ft. 36 inch channel frame with electric motors.
483 ft. 48 inch new conveyor belt, 880 ft. 36 inch, 600 ft. 24 inch new and 300 ft. 18 inch 5 ply.
One telesmith 4 yard stationary tilt mixer.
8 ft. x 32 ft. auto clave.
Wanted to buy Shovel Front for 601 Koehring 1½ yard.

B & G Sand and Gravel Co.
Ph. Rockwell 3-7411
Rt. 1, Box 402
Burlington, Wisconsin

COMPLETE ASPHALT PAVING SPREAD

All in good condition
Ready to Operate.

Standard Steel 4000# Semi-Portable Asphalt Plant all electric - complete with storage tanks, heater and all facilitating equipment, complete setup ready to produce hot mix	$61,500.00
Barber-Greene Finishing Machine, Model 879-A	5,500.00
Buffalo Springfield Tandem Roller, 6-9 ton	3,700.00
Buffalo Springfield Tandem Roller, 5-8 ton	3,500.00
¾ Yd. Lima Paymaster with 1 yd. bucket	6,000.00
D-6 Caterpillar Tractor with Dozer	6,000.00

We will sell individually or together.
Located now in the Southwest.

Metropolitan Equipment Co.
Box 3868, N.W. Station, Okla. City, Okla.
Phone No.: CE 2-8148

CONTRACTORS TRUCKERS DRILLERS CRANE OPERATORS
READY-MIX TRUCKERS LOGGERS MINE OWNERS PIPE LAYERS

CONVERT YOUR Rubber-Tire EQUIPMENT
to CRAWLER PERFORMANCE
Save 50%-ACT NOW!

MUD — SAND — SNOW — SWAMPS won't stop you! Flotation is increased 200%, and Traction 350%. TRUCK TRACK fits small as well as large tire sizes. Prices for single axle sets as low as $240.00 and for Tandem Axle sets, $400.00 F.O.B. Cleveland, Ohio.

TRUCK TRACK

QUICK and EASY to mount

Send for Literature and FREE ESTIMATE

TRUCK TRACK SALES COMPANY
3515 Broadway Ave. Cleveland 15, Ohio Phone UT 1-7373

FOR RENT OR SALE

Three—Gar Wood 625 Scrapers 25-yard Capacity

Two—CAT D-13000 Power Units Rebuilt and in excellent condition.

Two—Novo LH Single Drum Hoists for—25 HP Gasoline Engines 2500 lbs. capacity on single line.

One—Northwest Model 95 Dragline, powered with Murphy Diesel Engine, 60-foot Boom, S/N 5834. Excellent condition.

One—LeTourneau Heavy Duty Ripper

Northwest Model 95 Dragline and LeTourneau Ripper.

FEHRS TRACTOR & EQUIPMENT CO.

1809-11 Cuming Street, Omaha 2, Nebraska

We do a Nation-Wide business in

STEEL SHEET PILING

FOR SALE OR RENT

92 pcs. 73 to 65 ft. Beth. ZP-32—New York
187 pcs. 60 ft. Carn. MP-115—Illinois
242 pcs. 60 & 50 ft. Carn. MP-112—Ohio
393 pcs. 48 & 30 ft. Z-27 & Z-32—Louisiana
565 pcs. 48 & 40 ft. Z-27—Maryland
380 pcs. 40 to 30 ft. Beth. DP-2—Connecticut
318 pcs. 30 to 25 ft. Carn. MP-116—Virginia
80 pcs. 30 to 25 ft. Carn. MP-112—Florida

Other lengths and sections new and used at most all locations in the United States including storage yards at BUFFALO and CHICAGO — immediate shipment.

McKiernan-Terry and Vulcan Pile Hammers and Extractors.
Construction and railroad equipment.

We are as close as your telephone—you can obtain Steel Sheet PILING BY DIALING CHestnut 1-4474, St. Louis, Mo., collect.

MISSISSIPPI VALLEY EQUIPMENT CO.
1906 Railway Exchange Bldg.
St. Louis 1, Mo. CHestnut 1-4474

For Sale

1—53x60 heavy-duty, double impellor, Iowa Mfg. impact breaker, complete with 50"x14'x6" heavy-duty cast manganese feeder. Used 7 months.

2—42" conveyors. One conveyor 155' long; the other 160' long. Used 7 months.

1—McCully gyratory crusher #11.

1—Marion electric shovel, Model 6RS.

Numerous other units including ½-yard to 2½ yard shovels; Murphy & GMC power units & generator sets. Screens, jaw crushers, rolls, bucket elevators, etc. Some units mounted on rubber-tired chassis.

Write for complete list and prices to

Concrete Materials & Construction Co.

P. O. Box #790
Cedar Rapids, Iowa

LOADER

Cat. 933 Traxcavator, New 1-Yard Loader, Used only a few hours and returned for financial reasons.
PERFECT in every respect. Take advantage of the Payment already made and buy this "Like New" Tractor

SEVERAL THOUSAND DOLLARS BELOW NEW PRICE

DOZERS

AC HD-20 Garwood Hydraulic Good Operating Cond.....$7,500.
AC HD-9 & Hydraulic Perfect Operating Condition Track System 85% Good. Reconditioned & Re-painted.....$8,950

GRADER

AC Model D. Two in Stock. Excel. Operating Cond. Trade-in from Cities. Your choice.....$1,750
Cat. HT4 Hydraulic Loader 1953 Model 1¼ yd. New Rails - New Sprockets Reconditioned Throughout $6,750

Call • Wire • Write

MIDLAND
Machinery Company

Caterpillar Dealer
Box 145, St. Joseph, Missouri
Phone: 3-2516

Fall Clearance — Used Tractors

International TD18A, with Pullman angle dozer, serial No. TDA32500. Has new rails, idler and roller kits installed. Engine excellent. New in 1954.

Case "Terratrac", Model 500, Gasoline Tractor with angle dozer. 1½ years old, and in good condition.

International 300 Wheel Tractor with Henry Loader and Backhoe, 1 year old. Condition and appearance excellent.

Oliver HG-60 wide gauge loader—As is—$500.00.

Call or wire collect:

Beasley-Holmes Co.

3020 Reynolds Road
Toledo 6, Ohio
FRanklin 1494

FOR SALE: One cu. yd. Wagner Mixermobile used very little. Has standard tower plus 10 ft. extension and chute. Very reasonable.

ANDERSON EQUIPMENT CO., INC.
306 So. Virginia Street
Sioux City, Iowa

PRICED TO MOVE!!

Lorain ⅜ yd. TL 25, with 45' boom and fairleads. Long crawlers, 22" pads. Cat. D 315 motor. Excellent.

Manitowoc, model 2000, rated heavy duty 1¼ yd., 65' boom. Waukesha gas engine. Good.

Lima 802, rated 2½ yd. comb. shovel dragline, 2 drag buckets, Cat. D 17000 motor. Long, wide Crawlers. Good.

Lima 703 SC 50 ton lifting crane, 100 ft. boom, 25 ft. jib, diesel powered, long, wide crawlers. Delivered new 1956. Has less than 1,000 hours. Like new.

Also available steel barges and other types equipment.

JACK GARSON

P. O. Box 325 Norfolk, Va.
Phone: MA 23592

Pioneer - Eagle Washing Plant

All electric stationary plant, complete with plate feeder, delivery conveyors, 4' x 12', 3-⅛ deck screen; 3' x 6' single deck screen; 3 course material screw washers and 1 fine material screw washer. 5" high pressure pump with 75 HP Motor, complete with all piping, fittings, valves and structural supports. Designed to produce 2 types of sand and 3 sizes of course aggregate plus oversize.

Entire plant like new. Write for photos, detailed description and flow chart.

GIBBS COOK EQUIPMENT CO.
1314 Walnut, P. O. Box 936
Des Moines, Iowa

80-D Shovel attach. Complete
655-B P&H Shovel attach. Complete
22-N Shovel attach. Unused
80-B Backhoe attach. & N. W. 6
45 Bay City Shovel attach.
25 Northwest shovel attach.

AIR COMPRESSOR RENTAL CO. INC.
19615 Nottingham Rd. Cleveland 10, Ohio

FOR SALE
MARSH HAY & STRAW for Covering Hay

KOPFF HAY CO.
BEAVER DAM, WISCONSIN

STEEL SHEET PILING IN SOUTH

300 pcs. 15 ft. Corrugated Piling
629 pcs. Larssen 11 - 30' & 40'
318 pcs. AP-3 - 15', 20' & 30'
317 pcs. ZP-27 - 35' & 48'

SEABOARD STEEL CORP.
4521 South Tamiami Trail
Tel. RI 7-0461 Sarasota, Fla.

CONTRACTOR'S EQUIPMENT

For Sale, Rental or Rental With Purchase Option

All equipment may be inspected on location at Rapid City, South Dakota, Beverly, Nebraska and Denver.

1—Lima 803 2½ cu. yd. shovel, Cummins power and torque converter.
1—Lima 802 2 cu. yd. shovel with 85' dragline boom and Cat engine.
1—Lorain 820 2 cu. yd. shovel with 65' dragline, Waukesha powered.
9—D8 Caterpillar tractor with No. 25 Cat power control units. Several 8R models, balance 2Us.
6—Caterpillar 8S dozers.
4—Caterpillar DW20's 18-23 cu. yd. capacity.
4—Woolridge Terra Cobra TC-S14 tractor scraper units, 15-18 cu. yd. capacity.
3—LeTourneau "W" Scrapers, 24.00 x 32 rubber.
1—LeTourneau "F" Scraper, 18.00 x 24 rubber.
2—Fleco rock rakes, complete with arms.
4—McCoy and Gebhart sheepsfoot rollers, heavy U.S.B.R. and U.S.E.D. type.
1—Gallen No. 102 Motorgrader, IHC diesel powered.
1—Caterpillar No. 12 motorgrader.
6—Euclid 36 TD 22 ton end dump trucks, with Allison retarder brakes and Torqmatic transmission, Cummins 300 h.p. engine.
3—Ingersoll-Rand 600 C.F.M. Gyrofio air compressors.
1—Gardner-Denver 365 C.F.M. air compressor, Cat powered.
8—Cleveland DR34 3" and Ingersoll-Rand 4" Wagon drills.
1—Rex 34E dual drum paver.
1—Jaeger 16S concrete mixer.
1—Aggregate batch plant, complete with 2 cu. yd. Noble weigh-batcher, 4 compartment bunker bins, Cedarapids 3 deck aggregate shaker.

Also a large assortment of rock drills, paving breakers, air tampers, portable arc welders, hand power saws, radial saws, light plants (1½ to 10 KW), half ton to one ton pickup trucks—Ford F7 and F8 dump trucks, McCoy earth manipulator bars and 1½" to 6" pumps.

Assortment of ¾ to 3 cu. yd. dragline buckets—Esco, Page and Hendrix.

Call, Write or Wire

ADLER CONSTRUCTION CO.
3405 So. Lincoln St.
ENGLEWOOD, COLORADO
Ph. Denver, Colorado Sunset 9-1102
or Race 2-4181

FOR SALE

1. 1951 "L" Insley Backhoe Excavator, 36" bucket, 30" shoes, M&M gasoline engine, A-1 shape $11,500.00
2. 1950 "L" Insley Dragline Excavator, 35' boom, fairlead and used drag bucket ¾yd., 30" shoes, gasoline engine; in good working condition ..... $ 8,500.00

VOS EQUIPMENT CO., INC.
2575 West 28th St. S.W.
GRAND RAPIDS, MICHIGAN
Ph. Lenox 2-2381

FOR SALE!

NORTHWEST 95 COMBINATION CRANE DRAG, AND CLAM
WITH 75 FOOT BOOM

LATE MODEL—VERY GOOD CONDITION

C. R. SUNDBOOM
2288 University Avenue Phone: MIdway 6-8889
ST. PAUL, MINNESOTA

WANTED

2—Asphalt truck-mounted distributors. 900 gallon to 1,500 gallons. Late model. Prefer Etnytre or Littleford. Must be priced right and in excellent condition.

TESTA BROS., INC.
P. O. Box 36 Bedford, Ohio
Phone: BEdford 2-5151

SCRAPERS FOR SALE

1—Caterpillar 70
2—S-113 Bucyrus-Erie
1—12-yd. Hell

These scrapers are in good condition. We also have several good TD-18's with Double Drum Power Control Units.

ILLINOIS TRACTOR COMPANY
Mt. Vernon, Illinois
Phone 3053

FOR SALE—SIX USED CONCRETE TRUCKS AND MIXERS AND ONE USED CRANE

1951 Ford F8 Truck W/4 yd. 1948 Jaeger Mixer
1950 Ford F8 Truck W/4 yd. 1950 Jaeger Mixer
1949 Ford F8 Truck W/4 yd. Rex Mixer
1948 Ford F8 Truck W/4 yd. 1951 Smith Mixer
1948 International Truck W/4 yd. 1949 Jaeger Mixer
1947 White Truck W/4 yd. 1949 Jaeger Mixer

Will sell all six trucks and mixers for $9,000.00.

Michigan Model T6K ⅜ yd. Mobile Crane S/N 5581 with backhoe and boom attachments. Will sell for $2,250.00.

McKOY-HELGERSON COMPANY
Post Office Box 57 Greenville, S. C.
Phone CEdar 2-7633

NORTHWEST DIESEL
¾ YD., MODEL 25
Serial #9859, with shovel and backhoe attachment, in good condition, for.....$7,500.00

LOUIS DANIELE, INC.
Millbrook, New York - Phone 502

Clearing House Ads Bring Results

GRAVEL PLANT WANTED

Have experience, know how and desire. Some cash. Want going business small for one man, big enough for good living. Would consider ready mix plant on right terms.

Write Box 1193, Roads & Streets,
22 W. Maple St.
Chicago 10, Ill.

INDEX TO ADVERTISERS

Acker Drill Co., Inc. 167
Adler Construction Co. 183
Air Compressor Rental Co., Inc. 182
Air Survey Corporation 171
Allis-Chalmers, Construction Machinery Division 21, 22, 23, 24
American Bitumuls & Asphalt Co. 157
American Bosch 26
American Manganese Steel Division 100
American Steel & Wire Division.... 75
Anderson Equipment Co. 173, 177, 178, 181
Anderson Equipment Co., Inc. 182

B & G Sand and Gravel Co. 181
Bailey Bridge Equipment Company..179
Baldwin-Lima-Hamilton, Construction Equipment Division 30, 76
Barber-Greene 149
Baron Tire Company 179
Bausch & Lomb Optical Company ..143
Beasley-Holmes Co. 174, 175, 182
Beasley Machinery Co., Miller C. 179
Bement-Cahill Equip. Co. 181
Bethlehem Steel Company 3
Bianchi, Central, Munroe-Langstroth, Rugo 181
Blue Ball Machine Works 174
Blue Grass Minerals, Inc. 180
Bucks County Construction Co. 179
Buffalo-Springfield Roller Division—Koehring Company 114

Capitol Tractor & Equipment Inc....177
Caterpillar Tractor Co. ....54, 62 & 63, ...70 & 71, 97, 104, Third Cover
Chapin Cylinder Head Co. 174
Chevrolet Division of General Motors ....16 & 17
Chrysler Corporation, Industrial Engine Division ....Second Cover
Clark Equipment Company, Construction Machinery Division ...136 & 137
Cleaver-Brooks Company, Road Machinery Division 155
Cleveland Contractors Equipment Co. 177
Cleveland Trencher Co., The 6
Colorado Fuel and Iron Corporation, The 44
Columbia-Geneva Steel Division..75, 95
Concrete Materials & Construction Co. 182
Contractors Machinery Company ...180
Curry Equipment Corporation 178

Daniele, Inc., Louis 183
Daybrook Hydraulic Division 135
Deatherage & Son, Geo. E. 173
Drake Company, Donald M. 181
Drott Manufacturing Corp. ....34 & 35

Eighmy Eqiupment Company 178
Eimco Corporation 105
England's Sons Inc., J. F. 175
Etnyre & Co., E. D. 158
Evans, O. C. 177
Expansion Joint Institute ....106 & 107

F & R Company 178
Famalette Equipment Co., Frank ...176
Fehrs Tractor & Equipment Co. ...182
Firestone Tire & Rubber Company... 15
Fish Co., Inc., Charles V. 179
Fishel, Bill 178
Flexible Road Joint Machine Company, The ....140 & 141
Flink Company, The 46
Ford Division of Ford Motor Co., Industrial Engine Division 91
Ford Motor Company, Truck Division ....28 & 29
Frantz Equipment Company ...174, 176
French, James C. 174, 180
Frink Sno-Plows 139
Frink Sno-Plows of Canada, Ltd. ...139

Galion Iron Works & Mfg. Co., The.. 40
Garson, Jack 182
General Motors Corporation, Euclid Division ....45, 48 & 49
General Motors Corporation, Truck & Coach Division 81
General Tire & Rubber Co., The 41
Gibbs Cook Equipment Co. 175, 179, 182
Goodyear, Truck Tire Dept. 5
Greenville Steel Car Company 144
Gregory Co., Inc., K. H. 179
Grove, R. F. 176

Harnischfeger Corporation, Construction & Mining Division....10 & 11
Hart & Hart 176
Hartong, Inc., George H. 173
Hetherington & Berner Inc. ...152 & 153
Hotel Antlers 170
Hotel Continental 170
Hotel Knickerbocker 168
Hotel Pittsburgher 168
Huber-Warco Company ....42 & 43

Illinois Tractor Company 183
International Harvester Company, Construction Equipment Division..12 & 13
International Harvester Company, Drott Division ....34 & 35
International Harvester Company, Motor Trucks Division 7
International Harvester Company, Payhauler 72
International Salt Company, Inc. ... 14
Interstate Construction Co. 173
Interstate Equipment Company 176

Jackson Tractor Parts Co., Inc. 177

Kessler & Co., Stanley 176
Koehring Division of Koehring Company ....32 & 33
Kolman Manufacturing Co. 175
Kopff Hay Co. 182
Koppelman, Inc., W. H. 179

Laclede Steel Company 120
Lanford & Slater, Inc. 177
Le Roi Division of Westinghouse Air Brake Co. 102
LeTourneau-Westinghouse Company 47, 82, 113
Liberty Mutual Insurance Co....64 & 65
Link-Belt Speeder Corporation 37
Lubrecht, III, William 179
Lufkin Rule Company, The 163

Mack Trucks, Inc. 38
Madsen Works 160
Mall Tool Company, Division of Remington Arms Company, Inc.... 27
Massaglia Hotels 170
McDowell & McDowell 176
McKoy-Helgerson Company 183
Metropolitan Equipment Co. 181
Midland Machinery Company 182
Mississippi Valley Equipment Co....182
Monarch Road Machinery Co. 138
Motor Accessory & Supply Co., Ltd. 175
Muske Machinery Cartage, Inc. 179
Mutual Truck Parts Co., Inc. 173

Northwest Engineering Company ...101
Northwestern Parts Division 181

Omaha Standard 138
Owen Bucket Co., The 39

Portland Cement Association 98
Powell Equipment Co. 180
Prior Tire Company 180

Ranzau Co., George H. 178
Reo Division, The White Motor Company ....124 & 125
Ritz, Contractor, Albert 181
Robinson & Co., Inc., S. H. 175
Roebling's Sons, John A., Wire Rope Division 77
Rogers Bros. Corp. 36
Rogers Co., E. A. 171
Rubarite, The Goodyear Tire & Rubber Company 25

Seaboard Steel Corp. 182
Shaw Sales & Service Co. 175
Shell Oil Company ....118 & 119
Sinclair Refining Company, Technical Service Division 31
Skippers Auto & Truck Salvage 180
Sohio, Asphalt Division 146
Southern Tire Company 80
Stanhope, Inc., R. C. 176
Sundboom, C. R. 183
Swabb Equipment Co., Inc., Frank..177
Swenson Spreader & Mfg. Co. 159
Sylvania Electric Products, Inc., Lighting Division 99

Tampo Manufacturing Company ...163
Tennessee Coal & Iron Division...75, 95
Testa Bros., Inc. 183
Texas Company, The, Asphalt Sales Division ....Fourth Cover
Texas Company, The, Industrial Advertising Division ....8 & 9
Thomas, Wes 174
Timken-Detroit Axle Division, Rockwell Spring and Axle Co....130 & 131
Timken Roller Bearing Co., Industrial Division 18
Tractor & Equipment Co. 174
Tractor & Equipment Company 175
Trailmobile Inc. ....50 & 51
Troyer Equipment Co., Stanley B....173
Truck Track Sales Company 181
Twin Disc Clutch Company 53

Udelson Truck Sales, Inc. 178
Ukropina-Polich-Kral 176
United States Steel Corporation 95
United States Steel Export Company 75, 95
Universal Form Clamp Co. 126

Vandeventer Auto Sales 178
Vickers Incorporated 111
Vos Equipment Co., Inc. 183

Wall Colmonoy Corporation 52
Walton Sudduth Co., Inc. 173
Waukesha Motor Company 132
Whisler Equipment Co. 178
Wittenberg Motor Co. 174

Teer's CAT* No. 12s help build approach to Patapsco River Tunnel

An important new highway link for North-South travel is the Patapsco River Tunnel, south of Baltimore, Md. It will create a direct connection between Rt. 40 and U. S. 1 without bucking mid-city traffic.

Nello L. Teer Co. of Durham, N. C., is building a 2½-mile section of the four-lane divided expressway leading to the tunnel. The contract calls for moving 1,200,000 cubic yards of earth. Teer's spread on this job includes 12 Caterpillar DW20 Tractor-Scraper units, six D8s, a D9 and two Cat No. 12 Motor Graders.

Good haul roads contribute to low-cost earthmoving, and keeping roads in shape is a motor grader job. With its rugged construction, balanced design and dependable four-cycle Cat Diesel Engine, the No. 12 is built for top production around the clock. Positive-acting controls, easy blade positioning and excellent job visibility all help the operator do more work with less effort. The exclusive Caterpillar oil clutch operates smoothly many hundreds of hours without adjustment. Tubeless tires, at no extra cost, reduce tire down time. And in-cab starting, electric or gasoline, is standard.

Your Caterpillar Dealer not only sells these top-performance machines but takes a personal interest in protecting their long work life with reliable parts and service. See him today.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

WANTED— THE HARD WORK

THE LATEST, MOST COMPLETE INFORMATION ON THE NEW HIGHWAY PROGRAM — FREE

Here in one booklet is *all* the latest information on the new highway program. Find out how, where and when the money will be spent; standards for the new freeways; final routes of the Interstate System. Everything you need to know to share in the greatest construction job in history.

Dept. RS-8, Caterpillar Tractor Co.
Peoria, Ill.

Please send me immediately ..... copies of "The Road Ahead."

Name.....

Company.....

Address.....

City..... State.....

. . . for more details circle 246 on enclosed return postal card

There is a type of **asphalt** pavement to fit the need

For example, **on this highway—78 miles from contractor's asphalt plant—Texas laid hot-mix, cold-laid Texaco Asphaltic Concrete**

Blade graders spread the hot-mix, cold-laid Texaco Asphaltic Concrete surface in a series of thin layers.

Multi-wheel rubber-tired rollers are used for initial compaction of asphalt surface.

A 10-ton three-wheel roller gives final compaction to Texaco Asphalt pavement on US-290 in Texas.

Contractors

E. E. Hood & Sons
San Antonio, Texas
Bexar Asphalt Corp.,
San Antonio, Texas

ENGINEERING · RESEARCH · EDUCATION
THE ASPHALT INSTITUTE

MEMBER

The variety of road and street types which may be constructed with Texaco Asphalt products offers an important advantage to the road builder. These types differ in durability and in cost. One of them will supply the right answer to your paving problem, whether you are constructing a highway or street, airport or parking area.

In the case of the Texas state highway pictured here, the project was located 78 miles from the contractor's asphalt plant. This called for a type of asphalt mix which, after the long haul from the plant, still retained its workability when delivered on the job. The answer was hot-mix, cold-laid Texaco Asphaltic Concrete. Laid on a crushed stone foundation and a subbase of select material, it provides a durable yet economical pavement. Completely flexible from subgrade to surface, this pavement will absorb heavy impact year after year with a minimum of upkeep.

In plant-mixed types of Texaco Asphalt paving, either asphalt cement or cutback asphalt is used as the binding agent. Helpful information on methods and materials recommended for this important class of asphalt pavements is supplied in the booklet, "Plant-mixed Texaco Asphalt Paving." Our nearest office will be glad to send you a copy.

For more details circle 297 on enclosed return postal card.

THE TEXAS COMPANY, Asphalt Sales Div., 135 E. 42nd Street, New York City 17
Boston 16 Chicago 4 Denver 1 Houston 1 Jacksonville 2 Minneapolis 3 Philadelphia 2 Richmond 19

TEXACO
REG. T. M.

TEXACO ASPHALT